

APPENDIX A

Population and Need-Based Prevention of Unexplained Physical Symptoms in the Community

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SYNOPSIS

How might military medicine respond to existing research on the epidemiology, burden, natural history, and management of medically unexplained physical symptoms (MUPS) in primary care and the general population? This review of extensive published research suggests that MUPS are pervasive and contribute substantially to physical, social, occupational, and organizational impairment, psychosocial distress, unnecessary health care utilization and expenditures, and adverse health care outcomes. These studies suggest that the natural history of MUPS is influenced by a number of predisposing, precipitating, and perpetuating factors and that certain prognostic factors may help clinicians and policy makers estimate the outcomes and population needs.

We use the epidemiology of MUPS and the basic principles of population-based health care to construct an efficient MUPS prevention strategy that emphasizes a continuum of care. In the absence of randomized trial evidence of efficacy for any single multifaceted continuum of MUPS care, the prevention program suggested is conservative and reasonably achievable, lends itself to subsequent evaluation and improvement, and calls for a multifaceted, well-integrated, stepped care management approach involving

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The views expressed by Doctor Engel in this article are his own and do not reflect the official policy or position of the Department of the Army, the Department of Defense, or the U.S. Government.

- broad-based and low-intensity educational interventions delivered to every member of the military services and perhaps their family members;
- primary care-based collaborative and interdisciplinary practice teams that aim to improve short- and long-term health behaviors using a variety of behavioral strategies including education;
- information systems that use expert systems to process and feed back data obtained by using a health care-based health information system and a population survey-based health data monitoring system;
- specialized, multimodal services available for the intensive multidisciplinary management of disabling and otherwise treatment-refractory MUPS; and
- development of a “center of excellence” to lead clinical, research, and educational efforts related to MUPS in the military.

We suggest that future improvement efforts target military clinicians, military health care delivery, the military work environment, and existing methods for compensating and returning ill personnel to work.

No matter the overall process and structure of care provided for individuals with MUPS, physicians are urged to practice “person-centered” rather than “disease-centered” care. They cannot ignore their place as consultants to real people in real predicaments who are attempting to make difficult decisions potentially affecting their future health, career, relationships, and status. Hadler has stated that the role of physicians, “should be more than that of concerned citizens or even of patients’ advocates; [to that] we can add the perspective of students of the human predicament.”³⁸ The expanded notion of ill health as a human predicament is especially apropos in occupational and military medicine settings. Occupational and military physicians treat diseases, but of equal import is their obligation to study and prepare the workplace so those workers with illness-related work limitations can eventually make a successful return to productivity. Eventually, we are impressed that military medicine’s innovations in this area may provide an important model for civilian health care organizations seeking solutions to the difficult challenge of MUPS.

UNDERSTANDING MEDICALLY UNEXPLAINED PHYSICAL SYMPTOMS

The absence of a discerned cause for physical symptoms is best viewed through the lens of the scientific uncertainty necessarily involved in any one-to-one doctor–patient visit. We will use “MUPS” in reference to *health care use for physical symptoms that are not clinically explained by a medical etiology*. MUPS can be broken down into a four-part process. First, an individual must *experience* the symptom. In a simplified way, this might be viewed as the biological part of the process. Presumably, for one to perceive a symptom, some neurophysiological event must bring it to awareness. The second step is *cognitive*, or related to how we think about the symptom. The person perceiving a

symptom overlays some knowledge, biases, or beliefs that he or she has about the symptom and its cause, assigning it a level of medical importance. We do not seek care for most of the symptoms we experience, partly because we assign them some relatively low level of medical significance. When we seek care, we are taking a third and *behavioral* step that is mediated by our belief in the symptom's significance.

The fourth and final step is the purview of the clinician: he or she must decide the extent to which symptoms are explained by the patient's medical diagnoses. This is one of the most problematic aspects of MUPS. There is a clear potential for doctor-patient conflict in this formulation. Differing clinician and patient explanations for MUPS may be one of the most important contributors to the frustration that these symptoms create for clinicians^{61,97,154} and the dissatisfaction with care that many affected patients describe. Add some reason for doctor-patient mistrust, and the relationship can become outwardly adversarial and result in mutual rejection.¹²⁰

In occupational settings like the military, clinicians must provide care within the context of competing and sometimes unacknowledged obligations. The clinician is committed to the welfare of the employer, who is both paying the clinician's salary and providing medical benefits for the patient. This same clinician has a simultaneous duty to the health and well-being of the patient. Under these circumstances, the patient may fear that the clinician is being coerced to deny the reality of the medical problem in service to the employer's financial or political interests. The patient may feel that the clinician is more interested in keeping the patient on the job than in providing treatment. Alternatively, the clinician may suspect that the patient is exaggerating health concerns to obtain benefits. Conflicts such as these heighten doctor-patient mistrust, dampen rapport, and diminish the chance of a productive clinical encounter.

Symptom-based disorders are diagnoses based upon patient-reported physical symptoms rather than specific findings on clinical examination or diagnostic testing. Symptom-based disorders seldom offer clinicians and patients more than a label. In most instances, the prognosis, treatment, and factors that determine disability are remarkably similar across different symptom-based disorders. Observed differences are typically small and are attributable to differences in severity, the number of other symptoms involved with the syndrome, or differences in loss of functioning due to symptom location (e.g., lower-extremity joint pain impedes walking, whereas headache pain does not). The names of symptom-based disorders are usually based on hypothesized etiology (e.g., chronic Lyme disease), putative triggers (e.g., multiple chemical sensitivity), a central descriptive feature (e.g., chronic fatigue syndrome), or body region (e.g., temporomandibular disorder). Labels often use complicated terminology (e.g., fibromyalgia or myalgic encephalomyelitis) that suggests to patients, doctors, and the public that the syndrome is better understood than it actually is. Therefore, we will use the term *symptom-based disorder* to signify syndromes that are clinically diagnosed almost exclusively by using patients' verbal descriptions. Table A-1 displays some common examples of symptom-based disorders and illustrates that clinicians in nearly

every specialty encounter them. Symptom-based disorders overlap extensively, manifest remarkably similar pathophysiology, risk factors, clinical course, and prognosis, and respond to similar rehabilitative treatment approaches.^{17,23,54,67,118,158} Historically, physicians have tended to categorize MUPS and symptom-based disorders as psychiatric symptoms on the basis of exclusion. It seems most logical that only some MUPS are psychiatric in their origin.

TABLE A-1 Some Symptom-Based Diagnoses and the Specialties that Commonly Diagnose and Encounter Them

Specialty	Clinical Syndrome	Specialty	Clinical Syndrome
Orthopedics	Low back pain Patellofemoral syndrome	Dentistry	Temporomandibular dysfunction
Gynecology	Chronic pelvic pain Premenstrual syndrome	Rheumatology	Fibromyalgia Myofascial syndrome Siliconosis
Ear-Nose-Throat	Idiopathic tinnitus	Internal Medicine	Chronic fatigue syndrome
Neurology	Idiopathic dizziness Chronic headache	Infectious Diseases	Chronic Lyme disease Chronic Epstein-Barr virus Chronic brucellosis Chronic candidiasis
Urology	Chronic prostatitis Interstitial cystitis Urethral syndrome	Gastroenterology	Irritable bowel syndrome Gastroesophageal reflux
Anesthesiology	Chronic pain syndromes	Physical Medicine	Mild closed head injury
Cardiology	Atypical chest pain Idiopathic syncope Mitral valve prolapse	Occupational Medicine	Multiple chemical sensitivity Sick building syndrome
Pulmonary	Hyperventilation syndrome	Military Medicine	Gulf War Syndrome
Endocrinology	Hypoglycemia	Psychiatry	Somatoform disorders

EPIDEMIOLOGY OF SYMPTOMS AND SYMPTOM-BASED DISORDERS

Prevalence in the Community and Primary Care

Review of the epidemiology of unexplained physical symptoms necessarily involves discussion of the epidemiological literature on somatization and the somatoform disorders (e.g., conversion disorder, somatization disorder, or pain disorder). The central feature in the somatoform disorders, however, is the presence of MUPS. The absence of test abnormalities or objective physical examination findings means that a psychiatric etiology is presumed but that the actual etiology is a matter of debate. We advocate an atheoretical, nonetiological, and phenomenological understanding of MUPS since this formulation is intellectually honest and maximally acceptable to those affected.

Population-based surveys have shown that 85 to 95 percent of community respondents experience at least one physical symptom every 2 to 4 weeks although relatively few of these symptoms are reported to physicians.¹⁶¹ The population-based Epidemiologic Catchment Area Study examined 13,538 respondents from four U.S. communities and found that 25 percent reported chest pain, 24 percent reported abdominal pain, 23 percent reported dizziness, 25 percent reported headache, 32 percent reported back pain, and 25 percent reported fatigue.⁹¹ Thirty-one percent of symptoms were medically unexplained, and the type of symptom was unrelated to the absence of explanation. Eighty-four percent of symptoms caused respondents to seek health care, take a medicine, or curtail activities.⁹¹ Over 4 percent of people had a lifetime history of multiple, chronic, unexplained symptoms and an exacerbation within the past year.^{38,142}

Other studies have shown that MUPS are associated with a high proportion of populationwide disability and health care utilization, largely because they are so common.^{39,74} For example, the 1989 National Ambulatory Medical Care Survey estimated that physical symptoms account for 57 percent of all U.S. ambulatory care visits including some 400 million clinic visits per annum.¹²⁷ Kroenke and Mangelsdorff⁶⁰ reviewed the medical records of 1,000 primary care-internal medicine patients over a 3-year period and determined the incidence, diagnostic findings, and outcomes of 14 common symptoms. At least one common symptom was present in 38 percent of patients, and only 16 percent of symptoms were felt to have an organic cause. Symptomatic patients were monitored for an average of 11 months, and for 47 percent of patients the symptom persisted throughout the follow-up period. Two-thirds of symptoms were evaluated beyond the initial history and physical examination, but only approximately 1 in 10 evaluations resulted in an organic diagnosis not apparent at the index visit. Subsequently, Kroenke et al.⁸⁸ completed an office-based survey of 410 primary care-internal medicine patients to determine the prevalence and adequacy of therapy for 15 common symptoms. Eighty-two percent of patients had one or more symptoms, and in 77 percent one or more of these symptoms had been reported to patients' physicians. However, only 39 percent of patients with fa-

tigue, dyspnea, dizziness, insomnia, sexual dysfunction, depression, and anxiety reported any noticeable response to treatment. Most other primary care research suggests that etiologies are unknown for at least 25 to 30 percent of patients with either painful or nonpainful physical symptoms.^{87,92,93}

An extensive scientific literature has shown that MUPS are strongly and consistently associated with psychosocial distress, psychiatric disorders, decreased quality of life, and increased health care utilization.^{6,18,25,38,39,56,76,90,92,129,135} Depression and anxiety are consistently associated with MUPS across many studies that have used wide-ranging methodologies including cross-sectional,¹³⁵ case-control,^{73,82,140,152,156} and longitudinal designs.¹⁵⁰ Some evidence suggests that associated high health care utilization leads to more harm and patient dissatisfaction than benefit.^{86,145}

Natural History of MUPS

MUPS are characteristically chronic and intermittently relapsing, although the natural history is reasonably variable in severity and periodicity. Factors responsible for variability in clinical outcomes may be classified as predisposing, precipitating, and perpetuating factors.

Predisposing factors are characteristics of individuals that render them more vulnerable to MUPS and related morbidity. Important predisposing factors are heredity;^{136,162} neurophysiological, neurotransmitter, and autonomic nervous system factors;^{4,31,44,52,55,83,144} early life adversity (e.g., child maltreatment);^{3,26,68,85,98,152,153,155} chronic medical illness;^{2,12,66,121,147} or chronic distress or mental illness.^{34,70} Predisposing factors may be either intrinsic (i.e., innate to the individual) or acquired (i.e., obtained during lifetime exposure or experience).

A *precipitating factor* is essentially a “straw that breaks the camel’s back,” initiating an acute episode of MUPS and related morbidity. Factors that precipitate MUPS include biological stressors,^{15,134} psychosocial stressors,^{27,29} acute psychiatric disorders,¹¹¹ and epidemic health concerns.^{14,21,24,62,69,139}

Perpetuating factors are those that maintain, exacerbate, or prolong symptoms, distress, and disability after they occur. Perpetuating factors may occur independently of the original precipitants. They include harmful illness beliefs (beliefs that lead to a maladaptive response to the symptoms),¹³² labeling effects (i.e., the adverse effects associated with viewing oneself as ill),^{40,60,63,106} misinformation,^{1,7,16,100,130,133} workplace and compensation factors,^{11,59,128,141} and social support factors.¹⁰⁷

Prognostic Factors: Prediction of Outcomes and Assessment of Future Needs

MUPS occur along a spectrum of severity and prognosis⁷⁴ ranging from mild and transient to chronic and disabling. *Prognostic factors* are individual, environ-

mental, or population characteristics that may be used to predict symptom outcomes and estimate future treatment and resource needs. The prognostic spectrum of MUPS includes acute, recurrent, and chronic subtypes. *Acute MUPS* occurs in the absence of a previous pattern or history of MUPS and lasts a few months at most, and associated disability is often temporally associated with an acutely stressful life event. *Recurrent MUPS* is characterized by alternating symptomatic, asymptomatic, and mildly symptomatic periods. *Chronic MUPS* is a pattern of persistent unexplained physical symptoms associated with chronic disability, high health care utilization, and persistent problems with coping.

Empirically evaluated prognostic indicators for MUPS include (1) prior level of health care use, (2) psychiatric factors, (3) physical symptom factors, and (4) factors related to functioning. A high level of previous health care use suggests that a poor long-term outcome characterized by chronic MUPS is relatively likely.^{78,156} A large number of prospective studies have consistently found that the presence of stressors, distress, and psychiatric disorders, especially when they are chronic, predict persistent MUPS and related disability.^{9,13,22,29,57,65,105,109,119,126} A higher number of comorbid physical symptoms (“symptom count”)⁵³ and longer symptom duration^{13,22,89,95,148} also predict a poor outcome. Past poor functioning including occupational functioning suggests a poor prognosis.^{37,50,94} A patient’s historical level of functioning can serve as a marker for a myriad of issues that diminish the amount of reserve that an individual can muster when symptoms worsen.

PREVENTION OF SYMPTOMS AND SYMPTOM-BASED DISORDERS

The epidemiology of MUPS suggests that those individuals afflicted with the mysterious “Gulf War Syndrome” may represent only the most disabled, symptomatic, and distressed of ill Gulf War veterans. For each veteran who seeks care for Gulf War-related health concerns, there may be several others with fewer physical symptoms. In a less protean manner, perhaps, these individuals’ symptoms are reducing their capacity to function, increasing their use of health care, and heightening their health-related worries. Left unmanaged, these milder syndromes may become subject to the adverse influences of the previously described predisposing, precipitating, and perpetuating factors.

Is it possible to prevent MUPS? Resources are limited, and the scope of the problem is wide. The success of any program of prevention will depend on the degree of effectiveness of existing interventions and the resources required to deliver them. It may be feasible to significantly reduce the organizational impact of MUPS among military personnel by using a coordinated combination of population-based and need-based strategies. We recommend the adoption of a “population-based health care” model that uses a stepped-care approach (Figure A-1) to achieve maximum overall efficiency and effectiveness.

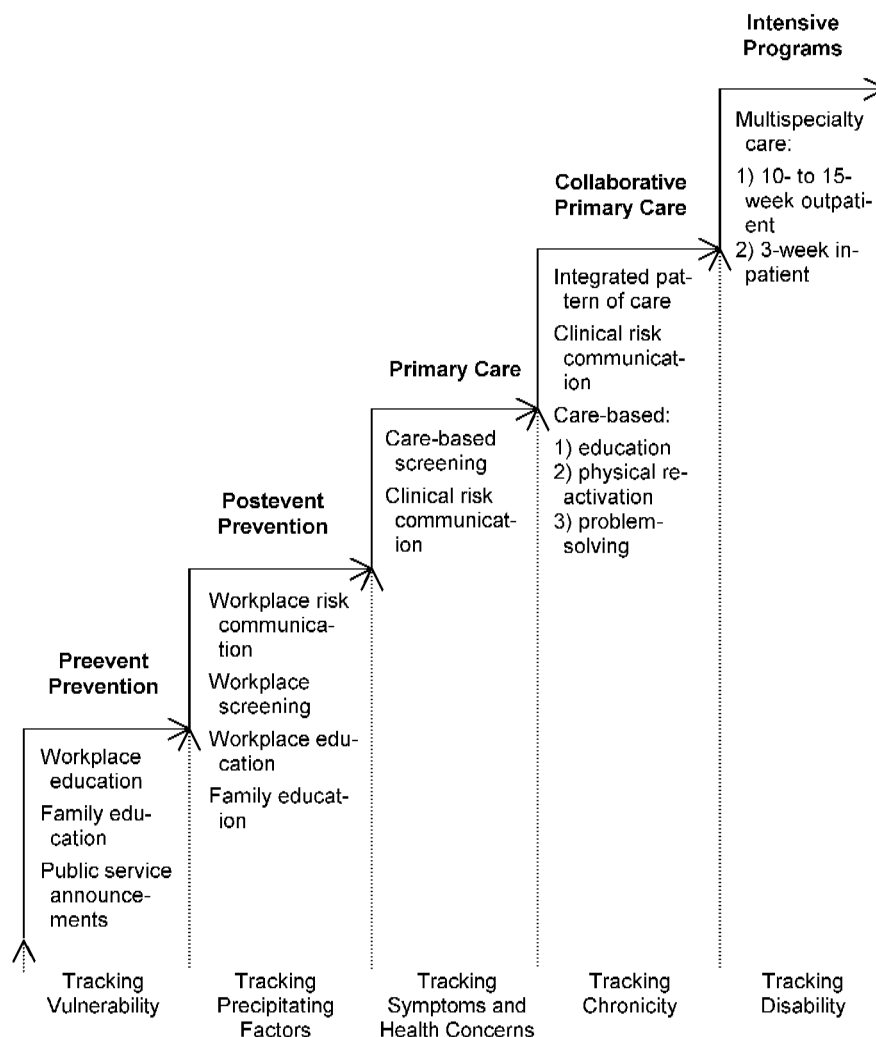


FIGURE A-1 A stepped-care approach to the population management of medically unexplained physical symptoms.

Advantages of Population-Based Intervention

Rose¹²³ has noted, “a large number of people exposed to a small risk may generate many more cases than a small number exposed to a high risk” (p. 24). Similarly, a large number of people exposed to a low-intensity preventive intervention can have a very large population effect (i.e., the effect of prevention summed across every person experiencing the intervention). Figure A-2 uses

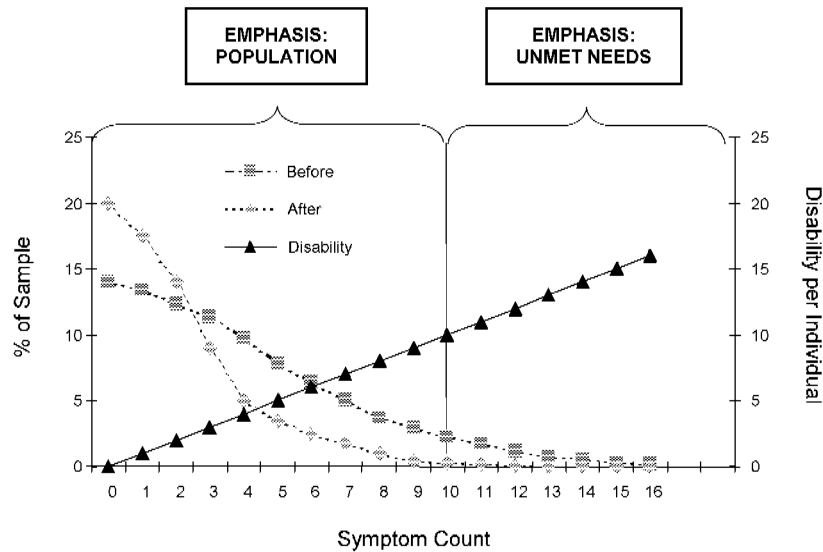


FIGURE A-2 Contrasting the population-based and needs-based approaches to reducing morbidity related to medically unexplained physical symptoms. Since disability (right vertical axis) is closely related to symptom count, population interventions that reduce symptoms a small amount per individual (“Before” = before intervention; “After” = after intervention) can prevent extensive disability when benefits are summed across the population. More intensive needs-based interventions can assist the relatively few individuals with repeated health care visits, multiple symptoms, and high levels of disability. Units of disability are hypothetical.

hypothetical data to illustrate that there is a graded and threshold-free relationship between symptom count and disability. Therefore, even among relatively healthy individuals, a small intervention benefit results in a small average individual improvement in functional status. Figure A-2 also shows that most of the population experiences relatively few symptoms and consequently little disability related to MUPS. When small reductions in individual disability occur across an entire population, the resulting societal benefits may be large and meaningful.

For the majority of people, MUPS come and go, usually without so much as a physician consultation. If these people are encouraged to seek health care for MUPS, it may increase the chance of long-term disability. This increase in disability may occur via mechanisms such as unnecessary worry, unnecessary avoidance of physical and social activities, unnecessary treatment, adverse effects of treatment, and provider errors.⁴² “Medicalization” of otherwise minor and transient symptoms may also occur. This is a process similar to labeling, wherein the act of visiting a doctor for a symptom imbues the symptom with catastrophic meaning, thereby setting up a self-fulfilling expectation of future disability.

In sum, population-based approaches to MUPS have the advantages of universal exposure to an intervention and summation of the benefit per individual across an entire population. Since many individuals who would never have become ill necessarily receive intervention, population-based interventions must have a lower potential for harm than most interventions employed for the sick.

Advantages of Need-Based Intervention

Interventions that target the whole population can seldom address the unmet needs of the important minority suffering from many symptoms and extensive disability. Rose¹²³ described health care-based preventive approaches as “the high risk strategy” because the effort is to identify individuals at especially high health risk or with especially great need for health care. The time-limited nature of clinical practice requires that providers rapidly recognize patients who require special attention. In essence, the clinician must identify and dichotomously delineate people lying along the continuum of disability severity as either ill or not ill. The point at which people are deemed ill is more or less arbitrary but necessary to operationalize so that the process of care can proceed unhindered. Using the hypothetical data from Figure A-2, for example, the “cutoff point” for identification of individuals in need of clinical care is set at 10 symptoms.

This artificial dichotomy leads to the specific advantages and disadvantages of health care-based prevention strategies. The primary advantage is that intervention can be matched to the unique needs of a relatively few seriously ill individuals, an approach that is attractive and sensible to both ill patients and their providers. Another advantage is that intervention aimed at the ill is minimally intrusive or harmful for those who are not ill. Riskier, more intensive, or more invasive interventions may be justified for “high risk” or ill individuals because of the comparatively large potential for individual benefit and the reduced societal cost conferred by limiting the intervention to a few.

On the other hand, clinical strategies contribute disappointingly little to any overall reduction of population disability. This is because only a very small proportion of society is ever exposed to a clinically based intervention that targets an ill or needy population. For example, Figure A-2 suggests that relatively few individuals have 10 or more symptoms, and many who have fewer than 10 symptoms will manifest significant disability and unmet needs that would not be addressed by a clinical intervention.

In sum, the population-based and need-based prevention approaches both offer important advantages and suffer from unique limitations. The best approach to the prevention of MUPS therefore involves some combination of population-based and need-based prevention, intervention, and management.

Population-Based Care: Matching Resources to Needs

Population-based care aims to improve health outcomes through carefully structured clinical services linked through primary care to a population-based prevention plan. Population-based care is the development and implementation of a detailed plan that covers all people in a defined population who, despite population-based prevention, have developed a chronic or recurrent health condition or concern. Important symptoms are identified, a mechanism to track outcomes is devised, and a deliberate matching of appropriate resources to patients with unmet needs occurs.¹⁵¹

Katon and colleagues⁸¹ have described how population-based care can reduce the prevalence of depression, and we advocate an analogous approach for MUPS. Critical is an understanding that various health care settings see different clinical populations with contrasting levels of MUPS severity and duration. More severely ill populations are encountered as the setting shifts from the community into higher levels of health care (e.g., tertiary care and inpatient hospital).

This is clearer when one considers the dynamics of illness in populations. Consider that the point prevalence (P) of some illness (i) is roughly equal to its incidence (I_i) times its average duration (D_i): $P_i \cong I_i * D_i$.¹²⁵ For intermittently relapsing illnesses such as MUPS, the duration of symptomatic illness can be approximated as the number of symptom episodes (N) times the average duration per symptom episode (D_e). Given some assumptions (beyond the scope of this discussion), the following can be shown:

$$P_i \cong I_i * D_e * N_i$$

This equation predicts that groups with more frequently episodic MUPS or MUPS of longer episode duration are overrepresented in populations because these characteristics elevate prevalence. The incidence of brief, nonrecurrent MUPS (e.g., acute back pain with a rapid resolution) may be relatively high compared with that of chronic MUPS. Even so, the long symptom duration and large number of episodes among those few individuals with an incident case of MUPS who develop chronic MUPS ensure that those with chronic MUPS are disproportionately represented in the population at any point in time. This overrepresentation of those with chronic and recurrent MUPS versus those with brief and acute MUPS is greater in specialty care than primary care and greater in referral facilities than local facilities. This occurs because local care and lower-intensity levels of care serve to “filter out” healthy and transiently ill individuals. Hence, the prevalence of chronic and recurrent illness is least in the general population, the greatest in specialty and tertiary referral settings, and intermediate in local and primary care settings.

The equation presented above suggests that the societal or organizational burden of MUPS may be reduced in at least three ways:

- incidence reduction or prevention of illness onset (primary prevention),

- duration reduction (secondary prevention), and
- relapse prevention (secondary prevention).

A fourth method of MUPS prevention (tertiary) targets the important morbid consequences of chronic MUPS: psychosocial distress, psychiatric disorders, and disability. From the equation, we would expect that the first three strategies might reduce the population prevalence of MUPS. The fourth approach may not alter the prevalence of MUPS but may still reduce the population burden of MUPS.

Implementing and Improving Population-Based Care

Wagner and coworkers¹⁵¹ have described how to implement and improve population-based care. They describe three distinct organizational thrusts: information systems, practice design, and patient education.

Information Systems

Information systems (ISs) are computer-based systems used to capture data that can be used to inform clinicians regarding patient status, assist clinicians and medical executives interested in monitoring and improving the quality of care, and guide policy makers attempting to assess population needs and determine appropriate staffing levels. An IS for MUPS should use three components: a *health information system* (HIS) (a passive automated health surveillance system), a survey-based *health monitoring system* (HMS) (an active health surveillance system), and *expert computer systems* (ESs) (automated systems that generate useful reports for the identification of high-risk patients and evaluation of care, population health status, and clinical outcomes).

The schematic in Figure A-3 shows the interrelationship of IS components to various tools that may enhance the population-based care of MUPS. The HIS can record medical problem lists and measures of health care utilization (out-patient, inpatient, and pharmacy services and various procedures), health care costs, and presenting symptoms. These data, combined with HMS-based data on patient-reported physical symptoms, may be used to define MUPS for tracking purposes and to identify high-, intermediate-, and low-risk groups. Katon and colleagues⁸¹ have suggested that the following elements are integral to any HIS that supports evidence-based interventions within a population-based health care system:

- regularly updated information on patients' primary care physician, place of care, and other contact information;
- current information on health care use including medication fills, procedures, laboratory results, primary care visits, and specialty care visits;
- a prioritized medical problem list; and

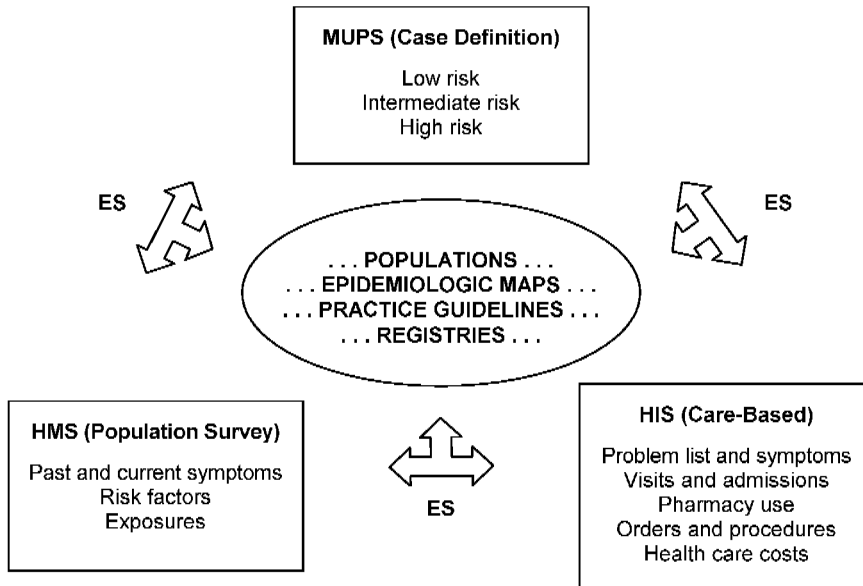


FIGURE A-3 Components of an IS used in population-based health care for MUPS and their relationship to one another. ES = expert computer systems, HIS = health information system, and HMS = health monitoring system

- other information relevant to establishing condition-specific patient registries for tracking and monitoring.⁸¹

The IS uses ESs to process raw data obtained with HMS and HIS, prepare these data for various uses, and deliver cleaned and collated data to appropriate users. ESs are programmed to generate tools that aid clinical management, patient follow-up, and treatment and policy decisions. Examples of ES tools include reports, reminders, clinical indicators, feedback systems, and guideline recommendations. ESs may be used to create registries, identify from a practice team panel patients who are likely to meet case criteria or who require intervention, monitor outcomes, compare outcomes for individual patients to those for groups of similar patients, and track the progress and relative prognosis of particular high-risk patients. An appropriate ES for MUPS might identify high-risk MUPS patients (for example, those with frequent visits or certain diagnostic codes from the International Classification of Diseases), remind clinicians of applicable guidelines and algorithms, identify relevant patient and family education tools, and implement screening scales or standard questions for consistent outcomes monitoring.⁸¹ Eventually, it will become possible to compare the relative impact of primary care, specialty care, and quality of care on MUPS outcomes.

In the future, linking of the HIS and HMS with *administrative information systems* (AISs) (e.g., military personnel files containing dates of promotion, disci-

plinary actions, awards, deployments, and evaluations of performance) may allow careful empirical evaluation of whether risk factors and interventions alter militarily relevant MUPS outcomes. The combined use of ESs, IISs, IIMSs, and AISs may provide for careful longitudinal tracking of the health status of individuals with MUPS who have recently deployed. Eventually, extensive empirical experience and understanding regarding the course of MUPS after deployments may be gained. IS data may be used to create population-based case registries and epidemiological maps showing the population distribution of people meeting case criteria. These individuals may be tracked for outcomes of potential interest such as long-term health care costs and service utilization, absenteeism, activity limitations recorded on military medical profiles, length of military career, rates of active duty reenlistment, promotion rates, and misconduct rates. Over time, refinements may be made to the existing case definition of MUPS so that it identifies individuals and groups at low, intermediate, and high risk of poor outcomes from MUPS. These data may also inform efforts to generate, implement, and evaluate pertinent clinical practice guidelines and best clinical practices.

Practice Design

Many have argued that the biggest barrier to quality clinical practice is the manner in which medical care is delivered.¹⁶¹ Ambulatory care involves patients seeking care for a myriad of poorly understood psychosocial and medical reasons. In the traditional acute care approach, a physician quickly narrows to an often oversimplified “chief complaint,” assesses only the most urgent medical needs, and then triages the patient to an appropriate level of care. Physicians managing acute medical problems are seldom practiced, skilled, or inclined to deliver preventive behavioral measures (e.g., dietary counseling, smoking cessation, and exercise prescription).

This approach fails to address the broad and often behaviorally based needs of people with chronic health conditions like MUPS. These individuals require systematic assessments, effective and targeted education, and sustained psychosocial support and follow-up aimed at maximizing long-term health and well-being. Their medical status may not become life threatening or severe enough to require acute medical attention until late in life or course of illness. By then, the opportunity to provide effective preventive measures has largely been lost.

The following are other barriers to the primary care management of MUPS:

- time restrictions and patient defensiveness;¹¹³
- high level of concern and low level of patient trust of military health care providers potentially responding to an organizational allegiance when caring for patients with MUPS after a deployment;
- reimbursement approaches that favor the use of invasive medical procedures over more behaviorally oriented rehabilitative care;³³

- clinician perceptions of MUPS patients as frustrating, noncompliant, and undesirable;^{61,97,112,151}
- inadequate coordination of care between primary and specialty care;¹¹³
- excessive reliance on physicians as the primary clinical facilitators of medical and behavioral change;
- disproportionate physician and media interest in disease-centered care featuring new technologies rather than patient-centered care stressing health behavior change; and
- an unwillingness or inability on the part of physicians to delegate crucial behavioral and educational aspects of the patient encounter that are best addressed by clinicians from nonmedical disciplines (e.g., nurses, psychologists, social workers, nutritionists, exercise physiologists, physical therapists).¹⁵¹

Improving primary care management of patients with MUPS requires far-reaching alterations in the culture, incentives, structure, and process of medical care as it is currently delivered. Given the demands on primary care, it seems unrealistic to expect that primary care physicians alone will comprehensively and intensively meet the diverse medical, educational, behavioral, and psychosocial needs of all MUPS patients. A more achievable goal is to develop a proximate, structured, collaborative, interdisciplinary, and multimodal process of primary care capable of reducing the burden of MUPS on primary care physicians. If primary care physicians can achieve success within the context of a reorganized clinic process, they may eventually find that behavioral management of MUPS and related distress and disability is rewarding and worthwhile.

Therefore, we recommend the development, implementation, and use of structured and carefully monitored health care programs that use *primary care practice teams*. Practice teams employ a wide range of nonphysician and physician providers collaborating together in a coordinated process of care. The team meets regularly to improve clinical coordination and intensify care-based efforts to inform patients about MUPS, prevent relapse of MUPS, increase physical activation, improve treatment adherence, respond to patient support needs, and hasten return to work.

Patient Education and Clinical Risk Communication

The range of patient education options is rapidly expanding. Carefully designed patient education materials are particularly important for those experiencing MUPS after deployments. Appropriate education materials can address harmful illness beliefs, the health effects of individual deployments, self-help strategies, the importance of managing disability and distress, the risks and limitations of extended diagnostic testing in “low-yield” clinical situations, and the ubiquitous nature of MUPS. Modalities available for disseminating patient information include brochures, mailings, books, videotapes, audiotapes, and waiting-room computers using self-guided learning approaches, as well as Inter-

net-based learning technologies. Nonphysician specialists trained in patient education strategies and information technologies may assist patients with their questions in a manner that fosters trust and reduces distress regarding unlikely causes of symptoms. They may help patients troubleshoot attempts to initiate regimens of regular physical activity, take their medicines regularly, and so on.

Health risk communication is a discipline that addresses methods of enhancing bilateral communication in “low-trust, high-concern” situations. We have already described the insidious impact of the physician’s competing and frequently unacknowledged obligation to the employer on the provider-patient encounter in occupational and military medicine. To date, risk communications experts have focused primarily on community-based methods of disseminating information and keeping communication constructive. However, risk communication approaches may be modified and applied to the low-trust, high-concern clinical encounter that occurs in occupational and military medicine settings. Risk communication imperatives are to carefully design and empirically test the impact of health risk messages. In clinical settings, we might ask: (1) Does a particular waiting room brochure foster patient trust in their physician? (2) Is there a way to restructure the clinical encounter that enhances communication between providers and patients under these tense situations? (3) What is the most effective way for a military physician to tell someone postdeployment that the person’s symptoms are medically unexplained without fostering fear of a progressive illness due to some poorly understood military-related toxic exposure? *Clinical risk communication* might be defined as the application of health risk communication approaches in the interest of enhancing the overall effectiveness of occupational, military, and analogous medical encounters.

Stepped-Care Approach to Population MUPS Management

A critical focus of population-based care involves matching intervention intensity to the severity, duration, disability, and psychosocial needs of patients. The stepped administration of specific interventions (i.e., administration from least to most intensive) ensures that the individuals with the greatest need receive the most intensive and costly treatments. Figure A-1 summarizes the stepped approach that we currently envision. It employs five basic steps: preevent prevention, postevent prevention, routine primary care, collaborative primary care, and intensive multidisciplinary care. Note that a high level of clinical certainty and rigorous empirical evidence is not required to initiate this care model. The approach that we describe may be and should be incrementally updated and revised as necessary research is completed.

Step One: Preevent Primary Prevention

Currently, the primary prevention of MUPS is poorly understood, and resource-intensive attempts to implement unproven primary prevention strategies seem premature and unnecessarily costly. Nonetheless, populationwide primary preventive efforts to prevent the onset of MUPS as well as associated distress and disability are deserving of further attention and research. For example, “step one” approaches such as organizational policies and regulations or community- or workplace-level education involving literature, television, or other media segments require study and may have significant value. Unfortunately, the effectiveness of such efforts for MUPS is anecdotal and largely unknown. The routine administration of high-intensity step one prevention is likely to overextend costly resources to the majority of individuals who will never develop health concerns, making feasibility a major concern. Therefore, large resource expenditures may be difficult for policy makers to justify in the absence of experimental evidence supporting the efficacy of preevent prevention.

One promising primary prevention modality is education and related programs. For example, Symonds and colleagues¹⁴³ found that a low-intensity workplace intervention for back pain prevented subsequent sick leave. The intervention involved reattribution of back pain by use of an educational program. Pamphlets were distributed to all workers regardless of back pain history. The pamphlet highlighted the benign nature of low back pain and the importance of activity maintenance and early return to work as ways to successfully reduce morbidity. The investigators also found the program shifted worker beliefs about the causes of back pain. Similarly, military personnel, their families and significant others, their leaders, and health care personnel may benefit from brief, simple, education-oriented efforts that provide appropriate information regarding MUPS and their relationship to distress and treatable psychiatric disorders.

One potential way of narrowing the scope, increasing the feasibility, and reducing the cost of intensified step one prevention is to inform them by using IS technology. For example, smaller groups with predisposing MUPS factors may respond to a targeted intervention. ISs may help narrow the focus of intensified efforts to mitigate the impacts of these factors on subsequent development of MUPS and related morbidity.

Step Two: Postevent Primary Prevention

We suggest narrowing the focus of postevent prevention to specific units and associated families that have recently deployed or faced other events that might precipitate subsequent health concerns. Within these units smaller groups at especially elevated risk of MUPS may be identified on the basis of the presence or absence of past MUPS or other predisposing factors. The “real-time” availability of IS data has the potential to focus preventive efforts at identified points of organizational vulnerability.

Several candidates for postevent preventive efforts deserve further attention and evaluation. Workplace-based briefings may teach recently deployed personnel the associated possible or known health risks. Leadership efforts to normalize the workplace through an early return to work routines and previously scheduled activities may maximize postevent productivity. A feeling of chaos and loss of control are common immediately after a tactical deployment or a catastrophic event. A rapid return to routines may provide personnel with a familiar and predictable environment and a feeling of productivity. The availability of support meetings and meetings open to some larger community (so-called town hall meetings) may provide a forum for military and community leaders to learn of event-related community and family concerns. Similarly, town hall meetings offer opportunities for personnel and significant others to articulate and even ventilate important event-related health concerns. If the event or deployment involved sufficiently large numbers, telephone hot lines may be useful, too, providing personalized contact for people with questions, concerns, or previously undiscovered events or exposures.

A large anecdotal literature often promotes large-scale postevent debriefings. However, randomized trials of critical incident debriefings (CIDs) have shown limited efficacy, and at least one study has suggested that CIDs may actually increase the risk of postevent psychological distress.¹⁵⁹ A CID uses a structured debriefing format often led by mental health professionals with various levels of experience and expertise. Those exposed to the "critical incident" are encouraged to review the event in detail, focusing on current emotions and emotions during the incident. Efforts are made to inform people of the signs and symptoms of psychological trauma. CID is difficult and costly to successfully implement on any wide scale, may set up self-fulfilling expectations of subsequent psychological symptoms and disability, and is empirically unsupported from the experimental trials completed to date.

As in step one, caution is necessary when considering relatively high-intensity preventive measures for people who have yet to develop MUPS. A commonly considered step two approach is populationwide postevent screening. These efforts may positively reinforce or "medicalize" what are otherwise normal transient symptoms following such events. Even given IS data regarding predisposing and precipitating factors, it may be difficult to accurately predict who will develop MUPS and even harder to know who among individuals with MUPS will then develop disability and distress. Singling high-risk individuals out for a psychosocial intervention before the onset of symptoms and disability may unnecessarily and unfairly stigmatize or prematurely label many individuals. Most of those labeled immediately postdeployment will not develop symptoms or their symptoms will be time limited. Therefore, primary care-based screening for MUPS, tracking of outcomes of MUPS, and intensification of treatment for those with suboptimal outcomes is the most practical and least costly approach.

Step Three: Routine Primary Care

As noted, feasible primary prevention strategies for MUPS are, unfortunately, of a low intensity; therefore, we can expect that new cases of MUPS will regularly occur even after relatively successful population-based prevention programs. Virtually all individuals with MUPS will encounter primary health care. Therefore, a key to secondary prevention may involve early primary care recognition and timely management of MUPS to reduce the impact of precipitating and perpetuating factors on physical symptoms, emotional distress, and disability. IS technologies may remind primary care physicians which of their patients are most symptomatic, most concerned about their health, and most distressed regarding undiagnosed illness. Once these patients are identified, there are several ways that clinicians may mitigate the impacts of precipitating and perpetuating factors in an effort to prevent a chronic course. These are now reviewed.

Routine Primary Care Physician Management *First, do no harm.* Most patients with MUPS have had extensive diagnostic evaluations. Often, clinicians are aware at the time of initial history and physical that diagnostic testing offers a low yield or that anxiety or depression are important exacerbating factors. Studies suggest, however, that for patients with MUPS, clinical awareness is not well integrated into physicians' diagnostic and treatment practices.⁸ As we have described, "shotgun" diagnostic testing under these circumstances can be harmful. Ordering unnecessary tests sends the wrong message to patients and promotes a passive patient mindset (e.g., "the doctor's in charge" and will "find it and fix it") that is counter to achieving behavioral activation goals and shifting some responsibility for wellness to the patient. Physicians are notoriously poor at making patients aware of the tests that they order, the rationale for ordering them, and the eventual results. One alternative to running new tests is for doctor and patient to carefully review past testing together, an approach that promotes clinician-patient collaboration and patient understanding. Sometimes, however, new diagnostic testing is necessary. A good rule of thumb for testing in patients with MUPS is to test only for classic constellations of symptoms or new objective signs.

Clinicians must take care not to present medications as a substitute for person-centered care for MUPS aimed at addressing health concerns and reducing disability. Although medical explanations for physical symptoms are often lacking, physicians often still place the patient on medications, even though medications are a relatively small part of the overall management of MUPS and unintended adverse effects often outweigh medication benefits. Sedatives are usually inappropriate unless insomnia is acute, stress related, and expected to abate within a short time. Narcotic analgesics usually do more harm than good, since they slow thinking, cause sedation, and reduce overall functioning. Both of these medication groups usually have adverse impacts on efforts to activate patients. Chronic administration of other central nervous system depressants such as so-called muscle relaxants is unadvised for similar reasons. Antidepressants,

however, reduce the occurrence of MUPS among patients with chronic pain, panic disorder, dysthymic disorder, and major depressive disorder. In addition, reductions in depression and anxiety are critical to behavioral activation. It is important to carefully explain the rationale for antidepressants, or else patients will assume they were prescribed because the doctor thinks that the symptoms are “in the head,” causing the patients to discontinue the medicine or see another doctor. All patients with MUPS should receive a complete and careful explanation of medication side effects, so that if they occur the clinician’s credibility is enhanced and the chances of continued adherence is maximized.

Cure rarely; comfort always. Seldom is it possible to cure any chronic illness, and MUPS are no exception. Setting symptom eradication as a treatment goal will only lead to clinician and patient dissatisfaction. Clinicians intent on cures often feel as though they have nothing to offer patients with MUPS. They may devalue their role with patients with MUPS as “doing nothing” or “hand-holding.” The importance of a supportive, empathic, and person-centered (rather than disease-centered) approach cannot be overemphasized.

Comforting patients with MUPS often entails reassurance. This means more than simply telling them that their symptoms are not serious. It involves elucidating harmful illness beliefs and directing education and advice to those beliefs. The following are common examples of harmful beliefs:

- “My symptoms are a sign of disease.”
- “When I hurt it means I am seriously injuring myself” (e.g., “pinching a nerve”).
- “When I have symptoms I can’t make it without rest and a break from my responsibilities.”

Clinicians can also learn the phrases that people with MUPS find belittling and avoid them. Similarly, they can learn some phrases that “join” the clinician and patient in a collaborative dialogue. For example, most individuals with MUPS describe their distress as secondary to symptoms. Although research is clear that distress increases the risk of subsequent physical symptoms and vice versa, it is best to adopt the patient’s words and views regarding causation, no matter how faulty the clinician may think they are. Patients understandably react negatively to physician statements such as, “There’s nothing physiologically wrong.” Perhaps most physicians suffer from a good deal of overconfidence in their own clinical conclusions and would benefit from allowing their patients to have more input than they currently do.

Comforting involves office-based patient education and often centers on the health effects of adverse life events and toxic exposures, the impacts of anxiety and mood on physiology, symptoms, and functioning, the limits of medical testing, and the impacts of medication side effects on functioning. Self-help materials such as audiotapes and books about physical activation, relaxation

techniques, and coping with chronic pain and similar symptom-based disorders are widely available.

Negotiate behavioral goals targeting illness and disability. Reducing disability requires specific changes in patient behavior. It requires patients to take an active, collaborative role in their treatment rather than a more traditional passive role ("fix me doc"). Provider-patient collaboration and negotiation of behavioral goals will usually prove to be more rewarding than striving for an elusive cure. Goals must be specific, incremental, realistic, and achievable, and they should center on observable or reportable behaviors. First and foremost, goals must be negotiated with the patient such that the patient "owns" the goals. If goals are simply clinician imposed, the patient may have no investment in them, view them as impossible, or covertly oppose them. It is often useful to have patients graph their incremental progress toward their goals and review the graphs with them at their follow-up appointments. Examples of good areas for goal formulation are occupational, household, or social task performance, physical activation, sleep hygiene, or medication adherence.

Hold the patient responsible for change, but avoid "the blame game." In disease-centered care, the patient is a passive participant. The patient is to "comply" with the doctor's "orders." The patient visits the doctor in search of answers, and the doctor is responsible for providing them. In person-centered care, the clinician must move out of the "answer man" role and join with the patient as a facilitator of behavioral change. The clinician negotiates the goals of treatment with the patient, helps him or her solve the problems "they" encounter, and carefully addresses the patient's expectations for quick or magical solutions. Simply acting as an "idea generator" for the obstacles that patients describe helps to facilitate behavioral gains. Clinicians must shift the responsibility for change to the patient, but they must also remain vigilant not to blame the patient for their lack of progress or their illness predicament.

Encourage physical and role reactivation. Regular exercise in tolerable doses helps patients with MUPS discharge distress, increase stamina, and improve functioning. Physical therapy programs of gradually increasing physical activity are sometimes useful for overcoming the deactivation and weight gain that occurs for many patients with MUPS. Usually, a physical therapist is not necessary to initiate reactivation strategies; these can be negotiated in the physician's office. Similarly, patients need encouragement to remain gainfully employed and active in supportive relationship roles. This reduces dependence and improves morale, self-confidence, and ability to meet expectations. In most occupational settings and especially in the military, reactivation strategies require careful coordination with employers or supervisors. The best reactivation plan will go awry if workplace supervisors are unaware of it or do not support it.

Involve social supports. Social supports may include family or close friends. Clinicians should encourage participation of support systems in nearly all aspects of care, provided that the patient approves of this. Family or friends can help clarify concerns, illness beliefs, symptoms, and deficits in functioning. Often, the patient's most important concerns are related to those closest to the patient, and their involvement in care can make or break the clinician's ability to successfully engage the patient in a constructive dialogue about the patient's health concerns. In occupational settings, the extent of involvement of the supervisor or employer must be similarly considered. "Collaboration" with the employer should seldom occur without the expressed (and usually written) permission and direct involvement of the patient. If organizational conditions, rules, or regulations pertain to employer or supervisor involvement, these should be clear and available to the patient from the time of the initial clinical contact or whenever it becomes apparent to either the patient or the clinician that employer involvement may occur.

Coordinate care with one designated clinician. Proper management of the delivery of care is both cost-effective and in the best interest of the patient. This is especially important for patients with many MUPS and those with chronic symptoms. In the absence of well-coordinated and centralized care, patients with multiple MUPS are likely to bounce from specialist to specialist, receive many unnecessary diagnostic procedures, and end up on multiple unnecessary medications. The key elements of coordinated care include (1) establishment of a relationship with a single primary care provider, (2) appointments at regular, time-contingent intervals of about every 4 to 6 weeks, (3) a brief physical examination at each visit to address new physical concerns, and (4) limits on patient-initiated visits for an exacerbation of otherwise chronic symptoms. Whenever possible negotiate an advance plan as to how symptom-contingent visits will be handled. If it is anticipated that this may become a problem, it is often sensible for clinician and patient to negotiate a written plan that both can refer to if limits become necessary. Some patients may fear that these limits mean that the doctor is angry with them or going to reject them. If the plan was previously negotiated and drafted in writing, these patient concerns may be tactfully addressed when they arise with minimal damage to the doctor-patient relationship. Consultants to the primary care physician must understand that they are to recommend care rather than assume it. Similarly, primary care clinicians should present consultants with a focused question. Consultants must understand their role and the key aspects of caring for patients with MUPS.

Anticipated and judicious mental health care referral. Psychiatric referral is frequently appropriate for those with MUPS, especially for patients who request it, have suffered a recent stressor, have a treatment-refractory psychiatric disorder, or describe suicidal or other clinically worrisome issues. However, most patients with MUPS do not require psychiatric treatment or psychological testing. Evidence suggests that a surprisingly large proportion of patients with

MUPS receive mental health referrals without an adequate explanation as to why they are needed.⁸⁶ In some cases, there is little doubt that a clinician desires primarily to “turf” (i.e., reject) a difficult patient. Not surprisingly, this message is seldom lost on the patient. Clinicians should not wait until the entire biomedical evaluation is complete and then obtain a referral because “potential medical causes are ‘ruled out’ and therefore the patient needs a psychiatrist.” To prevent patients from experiencing mental health referral as rejection, it is usually best for clinicians to anticipate the potential need and introduce it early in a non-threatening way. Patients are best told that a frequent consequence of MUPS is disabling distress and that appropriate care can mitigate the impacts of their symptoms on their quality of life. It is important that primary care clinicians see patients after completion of the mental health referral to reduce the patient concerns that the doctor is rejecting or abandoning them. Primary care clinicians should ask patients how they experienced the consultation and contact the consultant directly for recommendations if possible.

Unfortunately, most mental health professionals have only infrequent exposure to patients with MUPS, are not skilled in their management, and do not readily appreciate the need to collaborate closely with primary care. Even when done under ideal conditions, less than half of referred patients ever obtain mental health evaluation. Patient defensiveness, excessive rejection fears, and social stigma associated with having a psychiatric disorder are among the significant obstacles to effective mental health consultation for patients with MUPS.¹¹³

Clinicians often obtain psychological tests such as the Minnesota Multiphasic Personality Inventory with the expectation that it will provide them with hard-and-fast evidence that MUPS are psychological rather than physical in origin. These tests can offer information regarding the relative style, quality, and success of patient coping and distress. However, they are not effective for diagnosing a psychological etiology for physical symptoms. Extensive psychological testing is not a panacea and may be quite threatening to patients when administered under any clinical circumstance, especially when the assessment may have occupational or military ramifications.

Teaching MUPS Management to Primary Care Physicians One reason that physicians minimize the importance of MUPS is their lack of awareness of and comfort with appropriate management strategies. Naturally, they focus on things they know how to treat, and most think there is nothing they can do about MUPS. It is important to enable them through proper educational experiences that focus on the basic primary care strategies described earlier.

MUPS-related clinical training experiences may add to the overall quality of patient care by improving the routine primary care management of associated, frequently unrecognized, and treatable psychiatric disorders. Research suggests that an excessively biomedical approach to MUPS or coexisting chronic medical illness markedly diminishes physician attention to psychosocial aspects of care such as recognition of treatable anxiety and depressive disorders. Kirmayer and Robbins⁸¹ studied 685 patients presenting to a primary care clinic and found that

approximately three-fourths of those with major depression or anxiety disorders complained exclusively of physical symptoms. Studies have shown that mentally ill patients with emotional complaints are usually detected, whereas those with only physical complaints are generally missed.⁵¹

Providers in medical settings may sometimes collude with patients in ways that undermine effective health care. For example, the provider may detect mental illness in a patient but fail to offer treatment because he or she senses that the patient might be unreceptive. Some clinicians are better than others at identifying treatable psychiatric disorders in their patients.¹⁰¹ Conversely, distressed patients will more readily share their emotional concerns with those clinicians who are best at addressing them.⁵¹ Appropriate medical education emphasizing communication skills, MUPS, and the recognition and treatment of anxiety and depressive disorders by primary care providers may improve clinical outcomes and provider confidence in addressing patients' psychosocial issues.

Efforts to improve physicians' communication skills are critical to improving the routine primary care management of MUPS. Too often clinicians fail to acknowledge to themselves and to their patients the high degree of uncertainty inherent in all clinical practice, perhaps especially for those patients in whom no explanation is found for physical symptoms. Clinicians must learn and relearn that the "absence of an explanation" is not synonymous with a "psychological explanation." A fundamental tenet in the art of caring for MUPS is to acknowledge the centrality of aversive symptoms to the patient's life before asking the patient to take responsibility for overcoming those symptoms. Often physicians admonish their patients to actively seek a state of health, and some even equip their patients with tools for seeking that health. However, unless they first validate, empathize, and even immerse themselves in the patient's physical symptoms and their sense of personal damage, sacrifice, and suffering, most patients will feel misunderstood. Some will feel that the physician is blaming them for their illness. A few patients will experience an unspoken challenge, the challenge to prove the reality of their suffering. In short, physicians must make it their routine clinical mission to develop an appreciation for the extent that each patient constructs his or her life around symptoms, suffering, and limitations, whether or not medical explanations are available. For example, Marple and colleagues¹⁰² found that when physicians addressed patients' health worries and fears and understood the rationale behind their fears, their physical symptoms and functioning improved faster and the patient was more satisfied with care.

Physicians must develop strategies and experience explaining the limits of diagnostic testing and clinical treatments to their patients. Gallagher and co-workers⁴⁹ illustrated this in a recent study. Those investigators explored 39 internists' responses to a patient request for an expensive, unindicated diagnostic test. An actor was used to play out a standardized and blinded clinical scenario. Participating internists practiced in a health maintenance organization, and each encountered a young woman presenting with only chronic fatigue and no neurological symptoms. The patient desired magnetic resonance imaging (MRI) to rule out multiple sclerosis because of a friend's recent experience with the dis-

case. Only 10 percent of internists asked about the friend's illness, but 8 percent ordered the MRI and 22 percent said they might in the future. Fifty-three percent referred the patient for a neurology consultation on the day of the visit, and all but 13 percent of internists said they might refer the patient in the future.⁴⁹ This study is but one of many that illustrate the need for greater clinician education regarding strategies for addressing patients who press for unnecessary diagnostic testing or treatments.

Step Four: Collaborative Interventions in Primary Care

To benefit patients, specialists and primary care providers need to learn and respect each others' ideas, share resources, and learn ways of successfully working together to develop consensus around common goals like the population-based care of patients with MUPS. Particularly important is the need to develop collaborative on-site programs of behavioral health care for primary care providers. Such programs can enhance patient adherence to behavioral approaches initiated in primary care. In addition, on-site consultation reduces stigma by presenting it as a routine part of the primary care experience rather than something mysterious and remote. On-site collaboration also provides primary care providers with satisfying opportunities to interface with and learn from specialists from the other disciplines rather than the more traditional approach of referring complex primary care patients to specialists "right when they get interesting."

Several groups have looked at primary care-based psychosocial interventions for persons with MUPS, distress, or both. Strategies have most commonly involved screening,^{114 116} physician and patient education,⁵ primary care-based mental health consultation,⁷² interdisciplinary treatment teams,¹⁰⁸ and psychotherapy techniques adapted for primary care use.²⁰ Smith and colleagues^{71,124,137} have found replicable reductions in the cost of care and even small improvements in health-related quality of life for patients with the most severe forms of MUPS (i.e., patients with somatization disorder) simply by sending a set of short, codified recommendations to patients' primary care providers advising them on how to manage them.

Katon and colleagues⁷⁹ completed a randomized trial of psychiatric consultation for "distressed high utilizers of primary care" at Group Health Cooperative of Puget Sound, a health maintenance organization serving over 350,000 enrollees in Washington State. Distressed high utilizers were defined as the top 10 percent of ambulatory care utilizers over the year prior to study who were identified as distressed either by their primary care physician or by high scores on a validated paper-and-pencil measure. This 10 percent of patients utilized approximately one-third of all outpatient visits, 26 percent of all prescriptions, and one-half of all inpatient hospital days. The intervention consisted of a structured psychiatric research interview followed by a 30-minute collaborative patient interview and treatment planning session involving the generalist, psy-

chiatrist, and patient. Patients in the control group received usual primary care. Improvements in mental status or service utilization of intervention patients over that of controls could not be demonstrated. In retrospect, the intensity of the intervention was low, perhaps serving notice that MUPS involve many complex factors that are not responsive to a brief, one-time intervention that targets mainly psychiatric disorders. Prescription practices were marginally better for the intervention group, but subsequent antidepressant regimen adherence was generally poor for patients in both groups. There was no formalized mechanism for interdisciplinary collaboration after the initial consultation and no way of subsequently enhancing primary care clinicians' effectiveness or their adherence to the original collaborative care plan.⁷⁷

More recently, primary care approaches to physically symptomatic and distressed primary care patients have focused on "multimodal" or "multifaceted" interventions. These are best administered in steps, so that the most intensive, expensive, or burdensome treatments are held in reserve for those who are otherwise treatment refractory. Components have included screening; on-site mental health consultation; cognitive-behavioral and problem-solving therapies aimed at medication adherence, depression, MUPS, physical activation, and relapse prevention; videotapes, pamphlets, and other education materials on self-care; structured follow-up strategies; and standardized written primary care instructions. Other efforts to enhance primary care clinicians' ability to tackle the multiple needs of their patients have employed "academic detailing," feedback to clinicians from their patients' automated pharmacy or health care utilization records, and case management.

Katon and colleagues^{75,80} used a multifaceted approach to assist depressed primary care patients, an approach that can serve as a model for similar primary care-based MUPS interventions. Elements of their intervention targeted the patient, the physician, and the process of health care delivery. Elements that targeted patients were reading materials on depression, antidepressants, simple self-administered cognitive-behavioral techniques for managing depression, and a videotape on similar topics for viewing with spouses. Elements that targeted primary care physicians were didactics on antidepressants and behavioral treatment of depression, case-based consultation for each depressed patient, and ongoing interaction and feedback between the psychologist and primary care physicians. Elements that targeted the process of care were extensive and manualized. These included behavioral therapy done in the primary care setting. Behavioral therapy aimed at teaching patients depression self-management skills, improving medication regimen adherence, and preventing future relapses. Psychologist contacts were scheduled and occurred in the primary care setting. These contacts involved skills training, education, and homework. Relaxation training, assertiveness training, problem-solving training, and collaborative psychologist-patient development of a relapse prevention plan were done. Additional telephone contacts with the psychologist occurred after completion of primary care-setting contacts. Symptom monitoring occurred by a standardized measure and a checklist. The psychologist screened and documented antidepres-

sant side effects, dosing, and adherence. During weekly interdisciplinary team meetings, a psychiatrist reviewed antidepressant-related information and overall treatment progress. The psychiatrist would advise medication alterations as indicated, and the psychologist communicated these recommendations to the primary care physician, who would carry them out. This integrated process of care was carefully monitored for integrity by using a numeric rating system. These integrity ratings were monitored and used to provide regular clinician feedback.

Katon and coworkers⁷⁵ compared this collaborative interdisciplinary intervention to usual care for depressed primary care patients using a randomized controlled design. As long as 4 months after completion of the intervention, intervention patients with major depression reported greater satisfaction with care, adherence to the medication regimen, and improvement in depressive symptoms than major depression patients receiving usual care. The results of the intervention were less clearly favorable among patients with minor depression (significantly improved antidepressant regimen adherence and perceived antidepressant helpfulness, but there were no significant differences between the groups regarding depression symptoms or satisfaction with depression care).⁷⁵ Other analyses of these data have found evidence of improvements in physical symptoms. Analyses of cost-effectiveness found that the intervention was more costly than usual care for patients with both major and minor depression. However, for the major depression patients, the multifaceted intervention offered significantly greater cost-effectiveness than usual primary care.¹⁴⁹

Given the added expense associated with collaborative models, we suggest that they be held in reserve for patients for whom routine primary care management strategies for MUPS fail. Symptom duration is a key step four indicator to monitor using IS-generated reports. When a patient's symptoms reach some threshold of extended duration, more intensive collaborative efforts may be proactively introduced.

Step Five: Specialized Intensive Multimodal Care

There are several excellent examples on which to model tertiary prevention programs for patients with MUPS who fail to improve in response to collaborative primary care approaches. These programs are multimodal and multidisciplinary, occur in specialized (i.e., non-primary care) settings, and involve either a 3- to 4-week inpatient or intensive outpatient program or a 10- to 15-week program of weekly or biweekly individual or group visits. These programs emphasize carefully planned psychosocial elements that address the chronic nature of reduced functioning and the factors that reinforce it.

Usually, psychosocial and medical care is combined with a highly structured and generally supervised physical activation or exercise plan. These programs view disability as a behavior amenable to modification regardless of its biomedical etiology. Engel and colleagues³⁶ have described such a program for veterans with MUPS after service in the Gulf War. The intervention, called the

Specialized Care Program (SCP), is a 3-week intensive outpatient program modeled directly after the University of Washington's Multidisciplinary Pain Center.⁹⁹ Their preliminary data suggest that treated patients make mild to moderate gains in multiple domains including functional status and health-related quality of life, psychosocial distress, physical symptoms, and physical health concerns.³⁵

Bonica at the University of Washington was among the first to apply a multidisciplinary approach to the treatment of chronic pain patients in the late 1950s.⁹⁹ Since then, the approach has gained relatively wide acceptance for work-impaired chronic pain patients, especially those with back pain and fibromyalgia. A recent meta-analysis of 65 controlled studies of multidisciplinary interventions for chronic pain patients noted improvements in return to work rates, pain, mood, and health care utilization.⁴³ The authors were cautious in their conclusions, noting that the level of methodological rigor for most studies was low.

IS-generated reports may monitor the patient population for individuals who develop chronic MUPS-related disability. If patients are recognized early and enrolled in specialized intensive multimodal care for MUPS, the chances of satisfactorily returning them to work may be maximized.

Components of Specialized Services The following sections review the common components of most intensive programs and the research that supports their efficacy.

Cognitive-behavioral therapy. Until recently, most approaches to patients with treatment-refractory chronic pain or other persistent disabling MUPS have involved an intensive burst of multimodal care delivered over several weeks, usually in an inpatient setting. Perhaps not surprisingly, given the general shift in emphasis from inpatient care to less expensive outpatient approaches, recent studies have evaluated less intensive but more longitudinal treatment strategies. The best studied of these involve combined cognitive-behavioral therapy (CBT) and physical reactivation. CBT used in this context aims to help patients test and appropriately adjust harmful beliefs that they may have regarding the cause of their symptoms and the ways of treating their symptoms. Empirical trials have shown the benefits of CBT for a range of MUPS including chronic fatigue,¹³¹ irritable bowel syndrome,^{117,146} temporomandibular disorders,³² burning mouth syndrome,¹⁰ hypochondriasis,¹⁵⁷ and multiple MUPS.^{64,96,138}

Wessely's group³⁰ in London found that 63 percent of patients with chronic fatigue syndrome (CFS) showed significant improvement in their physical functioning after random assignment to CBT and physical activation, whereas only 19 percent assigned to relaxation training showed significant improvement. Improvements were enhanced over the 6 months following treatment. Significant improvements among CBT-physical activation recipients over those among the relaxation group were also noted in work and social adjustment, symptoms of fatigue, fatigue-related problems, and progress toward individualized long-term goals. Of note, improvements in dis-

tress and depression were only slightly better in the CBT-physical activation group, and the differences were not statistically significant.

Sharpe and colleagues¹³¹ completed a randomized trial of CBT for patients with CFS by comparing it with usual medical care. They found that 73 percent of patients assigned to CBT rated their outcome as satisfactory or better, whereas only 27 percent of the usual care group gave such a rating, a difference that was highly statistically significant. Sixty-three percent of the CBT group improved in their work functioning, whereas only 20 percent of the usual care group improved in their work functioning. Functioning, fatigue, and depression but not anxiety were also significantly improved. As one would hypothesize under a model of treatment with CBT, illness beliefs and coping were more positively altered for those assigned to CBT than for those assigned to usual care. As was observed in the previously described CBT-physical activation trial, outcomes continued to improve for months after the completion of the intervention.¹³¹

Physical activation and exercise. Exercise is known to have important physical and psychological impacts upon health and well-being.^{104,160} Using a randomized design, Fulcher and White⁴⁸ examined the impact of a gradually increasing program of supervised aerobic exercise for patients with CFS, comparing this approach to stretching and relaxation. After 12 weekly sessions, 51 percent of those assigned to exercise rated themselves globally as “much better” or “very much better,” whereas 27 percent of the stretching and relaxation group gave such a rating, a statistically significant difference, and improvements were stable over the subsequent several months. Fatigue, physical functioning, and fitness were also significantly better in the exercise group.⁴⁸ Similar findings after exercise programs have been noted for other chronic or symptom-based disorders such as post-polio syndrome,⁴¹ chronic low back pain,^{46,47} depressive disorders,¹⁶⁰ fibromyalgia,¹⁰³ and “effort syndrome.”¹¹⁰

Return-to-work strategies. Challenges exist around when and how to return workers with MUPS to work. There is general agreement that an early return to work is important to maintain role functioning and reduce chronic disability. There is evidence in the low back pain literature that a return to modified work can be successful.⁴⁵ Currently, the Army employs a profiling system of temporary or permanent work restrictions for those with diminished occupational functioning because of illness. Unfortunately, this approach may actually reinforce disability unless it is used in combination with a carefully supervised and graduated but relatively rapid return-to-work plan that is introduced to the worker very early in the rehabilitation process. For example, a 1-year follow-up of the use of work restrictions for nonspecific low back pain indicated they actually diminished the likelihood of return to work and did not reduce subsequent work absence or recurrences of back pain.¹⁹ A supervised and graduated return-to-work approach may be especially important in the military when aerobic physical conditioning such as long-distance running is required. A “profile” brands the worker as a problem to supervisors and coworkers. The loss of physi-

cal conditioning and endurance that occurs in response to persistent physical symptoms and resulting deactivation requires time and a graduated program to reverse. Abrupt and haphazard return of personnel to full physical duties and the expectation that they will immediately perform at the same levels as others in their unit will commonly produce failure and an increased sense of defeat for the worker. In contrast, a rapid return of workers to their full levels of supervisory and other nonphysical roles is indicated to reinforce organizational expectations that a rapid return to productivity is expected. Likewise, worker productivity helps bolster self-esteem and a sense of accomplishment.

Obstacles to Specialized Services The greatest obstacle to the development of specialized care for patients with MUPS is the perception on the part of administrators, policy makers, and clinicians that MUPS are neither disabling nor important. Although explanations of “stress” or “somatization” for unexplained physical symptoms serve an important clinical purpose for many MUPS patients, they are often used to minimize the needs of affected patients. Another barrier at present is the lack of an institutionalized niche for specialized care for MUPS, especially after combat and deployments. Both primary and tertiary care of MUPS is, as we have shown, interdisciplinary and requires the collaboration of many clinicians such as generalists, psychiatrists, psychologists, physiatrists, anesthesiologists, nurses, social workers, physical therapists, occupational therapists, and dietitians. In the current health care environment, each of these clinicians is responsible to a department head, and departments are demarcated along specialty lines. Interdisciplinary care of MUPS is a lesser priority for each of these departments than illnesses that fall more clearly within their specialty purview. When competing clinical demands are high, the argument that patients with MUPS suffer more from “nothing” than “something” seems compelling organizationally.

Another important obstacle to intensive models of MUPS care is the conventional sense that such care is too costly. Currently, it is not known whether the extra costs associated with appropriate intervention are offset by longer-term decreases in health care use and improvements in occupational functioning. Most patients referred to intensive MUPS care, however, are using unusually large amounts of health care and are functioning poorly, so the potential for gains appears to be great. Left untreated, patients with MUPS remain costly to society. For the military, MUPS seem certain to occur after future wars, and excellence in this aspect of patient care may pay public relations dividends as well as improve the care of affected veterans. Further research on the cost-effectiveness of specialized services for patients with treatment-refractory MUPS is needed to rigorously examine these issues.

CONCLUSIONS

Hadler⁵⁸ has described four major areas in which occupational physicians might contribute to the care of workers: clinical, educational, research, and pol-

icy making. We adhere to his comprehensive outline and offer our own thoughts and a few of his in concluding this review of MUPS and their relevance for the military and perhaps other employers.

First, physicians caring for workers with MUPS must foster improved worker adaptation to illness *as the worker experiences it*. Hadler has urged physicians to try to understand the “sociopolitical arena” in which illness occurs. We urge clinicians to go several steps further and design a system of care that is responsive to people and their subjective health concerns rather than diseases *per se*.

Second, physicians caring for workers with MUPS must develop appropriate educational experiences for other providers and for affected workers and their significant others. Clinician education should emphasize the psychosocial and behavioral contexts of illness and disability rather than only simplistic biomedical perspectives. Providers must become more sophisticated regarding the ways that environmental factors may shape behavioral responses to symptoms and to ill health.

Third, physicians caring for workers with MUPS must develop short-, intermediate-, and long-term clinical research and policy research agendas with explicit goals and objectives. These research agendas must address important military health practice and policy questions. Research into biological mechanisms, although important for understanding one basis of unexplained symptoms, is costly. History suggests that mechanistic research is slow to yield immediate answers of importance to workers, patients, and organizations. Rather, epidemiological research is necessary to aid policy makers’ attempts to comprehend the societal and military burdens of MUPS and the historical relevance of MUPS to diverse deployments.¹²² Hadler has recommended research on the impact of job demands on physical and emotional health and workers’ health perceptions, and this remains an area of need. Where, how, and why veterans with postdeployment health concerns seek their care and their satisfaction with that care is currently completely unknown within the military and is of great importance to prevention, treatment, and risk communication efforts.

Fourth, we suggest that physicians and policy makers move as rapidly as possible toward population-based models of health care and create system incentives for local-level development of novel interdisciplinary approaches to MUPS, interventions that span the spectrum of precare, primary care, collaborative primary care, and intensive specialty care. Physicians and policy makers must consider human factors whenever they are engaged in workplace structure and task design, since in the end, new technologies are effective only if the people who operate them are functioning well. Physicians and policy makers should carefully consider the impact of the prevailing military and U.S. Department of Veterans Affairs disability compensation system on incentives for workers to improve their health.

Given the necessary breadth of efforts to prevent MUPS in the military, we suggest the development of a “center of excellence” to lead clinical, research, and educational efforts related to MUPS in the military. A center of excellence could initiate and monitor efforts to implement clinical, educational, and re-

search agendas pertaining to MUPS. When appropriate, the center could provide input to military policy makers interested in ensuring that they consider the impact of MUPS as they design, monitor, and adjust military health policy. A center of excellence would centralize U.S. Department of Defense responsibility in this arena and enhance organizational accountability. Eventually, military medicine's innovations may provide an important model for civilian health care organizations seeking solutions to the difficult challenge of medically unexplained physical symptoms.

REFERENCES

1. Abbey SI, Garfinkel PI. Neurasthenia and chronic fatigue syndrome: The role of culture in the making of a diagnosis. *American Journal of Psychiatry* 1991; 148(12):1638-46.
2. Adler RH, Zlot S, Hurmy C, Minder C. Engel's "Psychogenic Pain and the Pain-Prone Patient:" A retrospective, controlled clinical study. *Psychosomatic Medicine* 1989;51(1):87-101.
3. Alexander RW, Bradley LA, Alarcon GS, et al. Sexual and physical abuse in women with fibromyalgia: Association with outpatient health care utilization and pain medication usage. *Arthritis Care Research* 1998;11(2):102-15.
4. Almy TP. Experimental studies on the irritable colon. *American Journal of Medicine* 1951;10:60-7.
5. Andersen SM, Harthorn BH. Changing the psychiatric knowledge of primary care physicians. The effects of a brief intervention on clinical diagnosis and treatment. *General Hospital Psychiatry* 1990;12(3):177-90.
6. Anderson JS, Ferrans CE. The quality of life of persons with chronic fatigue syndrome. *Journal of Nervous and Mental Disease* 1997;185(6):359-67.
7. Angell M. Breast implants—protection or paternalism? *New England Journal of Medicine* 1992;326(25):1695-6.
8. Barsky AJ, DeLamater BA, Clancy SA, Antman EM, Ahern DK. Somatized psychiatric disorder presenting as palpitations. *Archives of Internal Medicine* 1996; 156(10):1102-8.
9. Beitman BD, Kushner MG, Basha I, Lamberti J, Mukerji V, Bartels K. Follow-up status of patients with angiographically normal coronary arteries and panic disorder. *JAMA* 1991;265(12):1545-9.
10. Bergdahl J, Anneroth G, Perris H. Cognitive therapy in the treatment of patients with resistant burning mouth syndrome: A controlled study. *Journal of Oral Pathology and Medicine* 1995;24(5):213-5.
11. Bigos SJ, Battie MC, Spengler DM, et al. A prospective study of work perceptions and psychosocial factors affecting the report of back injury. *Spine* 1991;16(1):1-6.
12. Blumer D, Montouris G, Hermann B. Psychiatric morbidity in seizure patients on a neurodiagnostic monitoring unit. *Journal of Neuropsychiatry and Clinical Neurosciences* 1995;7(4):445-56.
13. Bombardier CH, Buchwald D. Outcome and prognosis of patients with chronic fatigue vs. chronic fatigue syndrome. *Archives of Internal Medicine* 1995;155(19): 2105-10.
14. Boxer PA. Indoor air quality: A psychosocial perspective. *Journal of Occupational Medicine* 1990;32(5):425-8.

15. Bridges KW, Goldberg DP. Somatic presentation of DSM III psychiatric disorders in primary care. *Journal of Psychosomatic Research* 1985;29(6):563–9.
16. Brown J, Chapman S, Lupton D. Infinitesimal risk as public health crisis: News media coverage of a doctor–patient HIV contact tracing investigation. *Social Science and Medicine* 1996;43(12):1685–95.
17. Buchwald D, Garrity D. Comparison of patients with chronic fatigue syndrome, fibromyalgia, and multiple chemical sensitivities. *Archives of Internal Medicine* 1994;154(18):2049–53.
18. Buchwald D, Umali P, Umali J, Kith P, Pearlman T, Komaroff AL. Chronic fatigue and the chronic fatigue syndrome: Prevalence in a Pacific Northwest health care system. *Annals of Internal Medicine* 1995;123(2):81–8.
19. Burton AK, Erg E. Back injury and work loss. Biomechanical and psychosocial influences. *Spine* 1997;22(21):2575–80.
20. Catalan J, Gath DH, Anastasiades P, Bond SA, Day A, Hall L. Evaluation of a brief psychological treatment for emotional disorders in primary care. *Psychological Medicine* 1991;21(4):1013–8.
21. Chester AC, Levine PH. The natural history of concurrent sick building syndrome and chronic fatigue syndrome. *Journal of Psychiatric Research* 1997;31(1):51–7.
22. Clark MR, Katon W, Russo J, Kith P, Sintay M, Buchwald D. Chronic fatigue: Risk factors for symptom persistence in a 2 1/2-year follow-up study. *American Journal of Medicine* 1995;98(2):187–95.
23. Clauw DJ, Schmidt M, Radulovic D, Singer A, Katz P, Bresette J. The relationship between fibromyalgia and interstitial cystitis. *Journal of Psychiatric Research* 1997;31(1):125–31.
24. Colligan M, Pennbaker J, Murphy. *Mass Psychogenic Illness: A Social Psychological Analysis*. Hillsdale, N.J.: Lawrence Erlbaum Associates; 1982.
25. Coryell W, Norton SG. Briquet's syndrome (somatization disorder) and primary depression: Comparison of background and outcome. *Comprehensive Psychiatry* 1981;22(3):249–56.
26. Craig TK, Boardman AP, Mills K, Daly-Jones O, Drake H. The South London Somatisation Study. I: Longitudinal course and the influence of early life experiences. *British Journal of Psychiatry* 1993;163:579–88.
27. Craig TK, Brown GW. Goal frustration and life events in the aetiology of painful gastrointestinal disorder. *Journal of Psychosomatic Research* 1984;28(5):411–21.
28. Craufurd DI, Creed F, Jayson MI. Life events and psychological disturbance in patients with low-back pain. *Spine* 1990;15(6):490–4.
29. Creed F. Life events and appendectomy. *Lancet* 1981;1(8235):1381–5.
30. Deale A, Chalder T, Marks I, Wessely S. Cognitive behavior therapy for chronic fatigue syndrome: A randomized controlled trial. *American Journal of Psychiatry* 1997;154(3):408–14.
31. Drake MEJ, Padamadan H, Pakalnis A. EEG frequency analysis in conversion and somatoform disorder. *Clinical Electroencephalography* 1988;19(3):123–8.
32. Dworkin SF, Turner JA, Wilson L, et al. Brief group cognitive-behavioral intervention for temporomandibular disorders. *Pain* 1994;59(2):175–87.
33. Eisenberg L. Treating depression and anxiety in primary care. Closing the gap between knowledge and practice. *New England Journal of Medicine* 1992;326(16):1080–4.
34. Engel CC Jr. A collaborative primary care-mental health program in the military. *Federal Practitioner* 1994;11(11):18–29.

35. Engel CC Jr., Liu X, Miller R, et al. A 3-week intensive outpatient behavioral medicine intervention for veterans with persistent, unexplained post-war symptoms (slide presentation). The Society of Behavioral Medicine, 19th Annual Scientific Sessions, New Orleans, 1998.
36. Engel CC Jr., Roy M, Kayanan D, Ursano R. Multidisciplinary treatment of persistent symptoms after Gulf War service. *Military Medicine* 1998;163(4):202-8.
37. Engel CC Jr., von Korff M, Katon WJ. Back pain in primary care: Predictors of high health-care costs. *Pain* 1996;65(2-3):197-204.
38. Escobar JI, Golding JM, Hough RL, Karno M, Burnam MA, Wells KB. Somatization in the community: Relationship to disability and use of services. *American Journal of Public Health* 1987;77(7):837-40.
39. Escobar JI, Rubio-Stipec M, Canino GJ, Karno M. Somatic symptom index (SSI): A new and abridged somatization construct. *Journal of Nervous and Mental Diseases* 1989;177(3):140-6.
40. Feinstein AR. Nosologic Challenges of Diagnostic Criteria for a "New Illness." Conference on Federally Sponsored Gulf War Veterans' Illnesses Research: June, 1998; Pentagon City, Va.
41. Feldman RM, Soskolne CL. The use of nonfatiguing strengthening exercises in post-polio syndrome. *Birth Defects Original Article Series* 1987;23(4):335-41.
42. Fisher ES, Welch HG. Avoiding the unintended consequences of growth in medical care: How might more be worse? *JAMA* 1999;281(5):446-53.
43. Flor-H, Fydrich T, Turk DC. Efficacy of multidisciplinary pain treatment centers: A meta-analytic review. *Pain* 1992;49:221-30.
44. Flor-Henry P, Fromm-Auch D, Tapper M, Schopflocher D. A neuropsychological study of the stable syndrome of hysteria. *Biological Psychiatry* 1981;16(7):601-26.
45. Frank JW, Brooker AS, DeMaio SE, et al. Disability resulting from occupational low back pain. Part II: What do we know about secondary prevention? A review of the scientific evidence on prevention after disability begins. *Spine* 1996;21(24):2918-29.
46. Frost H, Klaber Moffett JA, Moser JS, Fairbank JC. Randomised controlled trial for evaluation of fitness programme for patients with chronic low back pain. *BMJ* 1995;310(6973):151-4.
47. Frost H, Lamb SE, Klaber Moffett JA, Fairbank JC, Moser JS. A fitness programme for patients with chronic low back pain: 2-year follow-up of a randomised controlled trial. *Pain* 1998;75(2-3):273-9.
48. Fulcher KY, White PD. Randomised controlled trial of graded exercise in patients with the chronic fatigue syndrome. *BMJ* 1997;314(7095):1647-52.
49. Gallagher TH, Lo B, Chesney M, Christensen K. How do physicians respond to patient's requests for costly, unindicated services? *Journal of General Internal Medicine* 1997;12(11):663-8.
50. Gatchel RJ, Polatin PB, Kinney RK. Predicting outcome of chronic back pain using clinical predictors of psychopathology: A prospective analysis. *Health Psychology* 1995;14(5):415-20.
51. Goldberg D. Reasons for misdiagnosis. Sartorius N, Goldberg D, de Girolamo G, Costa e Silva J-G, Lecrubier Y, Wittchen U., Editors. *Psychological Disorders in General Medical Settings*. Lewiston, N.Y.: Hogrefe and Huber; 1990:139-45.
52. Goldenberg DL. Fibromyalgia syndrome. An emerging but controversial condition. [Review]. *JAMA* 1987;257(20):2782-7.

53. Goldman SI., Kraemer DT, Salovey P. Beliefs about mood moderate the relationship of stress to illness and symptom reporting. *Journal of Psychosomatic Research* 1996;41(2):115–28.
54. Gomborone JH, Gorard DA, Dewsnap PA, Libby GW, Farthing MJ. Prevalence of irritable bowel syndrome in chronic fatigue. *Journal of the Royal College of Physicians of London* 1996;30(6):512–3.
55. Gordon E, Kraiuhin C, Kelly P, Mcarcs R, Howson A. A neurophysiological study of somatization disorder. *Comprehensive Psychiatry* 1986;27(4):295–301.
56. Gureje O, Von Korff M, Simon GE, Gater R. Persistent pain and well-being: A World Health Organization study in primary care. *JAMA* 1998;280(2):147–51.
57. Gwee KA, Graham JC, McKendrick MW, et al. Psychometric scores and persistence of irritable bowel after infectious diarrhoea. *Lancet* 1996; 347(8995):150–3.
58. Hadler NM. Occupational illness. The issue of causality. *Journal of Occupational Medicine* 1984;26(8):587–93.
59. Hadler NM. If you have to prove you are ill, you can't get well. *Spine* 1996;21(20):2397–2400.
60. Hadler NM. Fibromyalgia, chronic fatigue, and other iatrogenic diagnostic algorithms. Do some labels escalate illness in vulnerable patients? [see comments]. [Review] [46 refs]. *Postgraduate Medicine* 1997;102(2):161–2, 165–6, 171–2 passim.
61. Hahn SR, Thompson KS, Wills TA, Stern V, Budner NS. The difficult doctor–patient relationship: Somatization, personality and psychopathology. *Journal of Clinical Epidemiology* 1994;47(6):647–57.
62. Hall EM, Johnson JV. A case study of stress and mass psychogenic illness in industrial workers. *Journal of Occupational Medicine* 1989;31(3):243–50.
63. Haynes RB, Sackett DL, Taylor DW, Gibson ES, Johnson AL. Increased absenteeism from work after detection and labeling of hypertensive patients. *New England Journal of Medicine* 1978;299(14):741–4.
64. Hellman CJ, Budd M, Borysenko J, McClelland DC, Benson H. A study of the effectiveness of two group behavioral medicine interventions for patients with psychosomatic complaints. *Behavioral Medicine* 1990;16(4):165–73.
65. Hotopf M, Mayou R, Wadsworth M, Wessely S. Temporal relationships between physical symptoms and psychiatric disorder. Results from a national birth cohort. *British Journal of Psychiatry* 1998;173:255–61.
66. Hotopf M, Mayou R, Wessely S. Childhood risk factors for adult medically unexplained symptoms: Results from a prospective cohort study. 44th Annual Meeting of the Academy of Psychosomatic Medicine 1998.
67. Hyams KC. Developing case definitions for symptom-based conditions: The problem of specificity. *Epidemiological Reviews* 1998;20(2):148–56.
68. Irwin C, Falsetti SA, Lydiard RB, Ballenger JC, Brock CD, Brenner W. Comorbidity of posttraumatic stress disorder and irritable bowel syndrome. *Journal of Clinical Psychiatry* 1996;57(12):576–8.
69. Johanning I, Auger PL, Reijula K. Building-related illnesses. *New England Journal of Medicine* 1998;338(15):1070; discussion 1071.
70. Kaplan DS, Masand PS, Gupta S. The relationship of irritable bowel syndrome (IBS) and panic disorder. *Annals of Clinical Psychiatry* 1996;8(2):81–8.
71. Kashner TM, Rost K, Smith GR, Lewis S. An analysis of panel data. The impact of a psychiatric consultation letter on the expenditures and outcomes of care for patients with somatization disorder. *Medical Care* 1992;30(9):811–21.
72. Kates N. Psychiatric consultation in the family physician's office. Advantages and hidden benefits. *General Hospital Psychiatry* 1988;10(6):431–7.

73. Katon W, Hall ML, Russo J, et al. Chest pain: Relationship of psychiatric illness to coronary arteriographic results. *American Journal of Medicine* 1988;84(1):1-9.
74. Katon W, Lin E, Von Korff M, Russo J, Lipscomb P, Bush T. Somatization: A spectrum of severity. *American Journal of Psychiatry* 1991;148(1):34-40.
75. Katon W, Robinson P, Von Korff M, et al. A multifaceted intervention to improve treatment of depression in primary care. *Archives of General Psychiatry* 1996; 53(10):924-32.
76. Katon W, Russo J. Chronic fatigue syndrome criteria. A critique of the requirement for multiple physical complaints. *Archives of Internal Medicine* 1992;152(8):1604-9.
77. Katon W, Von Korff M, Lin E, Bush T, Ormel J. Adequacy and duration of antidepressant treatment in primary care. *Medical Care* 1992;30(1):67-76.
78. Katon W, Von Korff M, Lin E, et al. Distressed high utilizers of medical care. DSM-III-R diagnoses and treatment needs. *General Hospital Psychiatry* 1990; 12(6):355-62.
79. Katon W, Von Korff M, Lin E, et al. A randomized trial of psychiatric consultation with distressed high utilizers. *General Hospital Psychiatry* 1992;14(2):86-98.
80. Katon W, Von Korff M, Lin E, et al. Collaborative management to achieve treatment guidelines. Impact on depression in primary care. *JAMA* 1995;273(13):1026-31.
81. Katon W, Von Korff M, Lin E, et al. Population-based care of depression: Effective disease management strategies to decrease prevalence. *General Hospital Psychiatry* 1997;19(3):169-78.
82. Katon WJ, Buchwald DS, Simon GE, Russo JE, Mease PJ. Psychiatric illness in patients with chronic fatigue and those with rheumatoid arthritis. *Journal of General Internal Medicine* 1991;6(4):277-85.
83. Katon WJ, Sullivan M. Antidepressant treatment of functional somatic symptoms. Mayou RA, Bass C, Sharpe M, Editors. *Treatment of Functional Somatic Symptoms*. New York: Oxford University Press; 1995.
84. Kirmayer LJ, Robbins JM. Three forms of somatization in primary care: Prevalence, co-occurrence, and sociodemographic characteristics. *Journal of Nervous and Mental Disease* 1991;179(11):647-55.
85. Koss MP, Koss PG, Woodruff WJ. Deleterious effects of criminal victimization on women's health and medical utilization. *Archives of Internal Medicine* 1991; 151(2):342-7.
86. Kouyanou K, Pither CE, Wessely S. Iatrogenic factors and chronic pain. *Psychosomatic Medicine* 1997;59(6):597-604.
87. Kroenke K. Symptoms in medical patients: An untended field. *American Journal of Medicine* 1992;92(1A):3S-6S.
88. Kroenke K, Arrington ME, Mangelsdorff AD. The prevalence of symptoms in medical outpatients and the adequacy of therapy. *Archives of Internal Medicine* 1990;150(8):1685-9.
89. Kroenke K, Jackson JL, Chamberlin J. Depressive and anxiety disorders in patients presenting with physical complaints: Clinical predictors and outcome. *American Journal of Medicine* 1997;103(5):339-47.
90. Kroenke K, Mangelsdorff AD. Common symptoms in ambulatory care: Incidence, evaluation, therapy, and outcome. *American Journal of Medicine* 1989;86(3):262-6.
91. Kroenke K, Price RK. Symptoms in the community. Prevalence, classification, and psychiatric comorbidity. *Archives of Internal Medicine* 1993;153(21):2474-80.

92. Kroenke K, Spitzer RL, deGruy FV3rd, et al. Multisomatoform disorder. An alternative to undifferentiated somatoform disorder for the somatizing patient in primary care. *Archives of General Psychiatry* 1997;54(4):352–8.
93. Kroenke K, Spitzer RL, Williams JB, et al. Physical symptoms in primary care. Predictors of psychiatric disorders and functional impairment. *Archives of Family Medicine* 1994;3(9):774–9.
94. Kroenke K, Wood DR, Mangelsdorff AD, Meier NJ, Powell JB. Chronic fatigue in primary care. Prevalence, patient characteristics, and outcome. *JAMA* 1988;260(7):929–34.
95. Lembo T, Fullerton S, Diehl D, et al. Symptom duration in patients with irritable bowel syndrome. *American Journal of Gastroenterology* 1996;91(5):898–905.
96. Lidbeck J. Group therapy for somatization disorders in general practice: Effectiveness of a short cognitive-behavioural treatment model. *Acta Psychiatrica Scandinavica* 1997;96(1):14–24.
97. Lin EH, Katon W, Von Korff M, et al. Frustrating patients: Physician and patient perspectives among distressed high users of medical services. *Journal of General Internal Medicine* 1991;6(3):241–6.
98. Linton SJ. A population-based study of the relationship between sexual abuse and back pain: Establishing a link. *Pain* 1997;73(1):47–53.
99. Loeser JD, Egan KJ, Editors. *Managing the Chronic Pain Patient: Theory and Practice at the University of Washington Multidisciplinary Pain Center*. New York: Raven Press; 1989.
100. Loeser JD, Sullivan M. Doctors, diagnosis, and disability: A disastrous diversion. *Clinical Orthopaedics and Related Research* 1997(336):61–6.
101. Marks JN, Goldberg DP, Hillier VF. Determinants of the ability of general practitioners to detect psychiatric illness. *Psychological Medicine* 1979;9(2):337–53.
102. Marple RL, Kroenke K, Lucey CR, Wilder J, Lucas CA. Concerns and expectations in patients presenting with physical complaints. Frequency, physician perceptions and actions, and 2-week outcome. *Archives of Internal Medicine* 1997;157(13):1482–8.
103. McCain GA, Bell DA, Mai FM, Halliday PD. A controlled study of the effects of a supervised cardiovascular fitness training program on the manifestations of primary fibromyalgia. *Arthritis and Rheumatism* 1988;31(9):1135–41.
104. McCully KK, Sisto SA, Natelson BH. Use of exercise for treatment of chronic fatigue syndrome. *Sports Medicine* 1996;21(1):35–48.
105. McDonald AJ, Bauchier PAID. Non-organic gastro-intestinal illness: A medical and psychiatric study. *British Journal of Psychiatry* 1980;136:1276–83.
106. Meador CK. The art and science of non-disease. *New England Journal of Medicine* 1965;272:92.
107. Murray J, Corney R. Not a medical problem? An intensive study of the attitudes and illness behaviour of low attenders with psychosocial difficulties. *Social Psychiatry and Psychiatric Epidemiology* 1990;25(3):159–64.
108. National Institute of Mental Health. Mental disorder and primary medical care: An analytical review of the literature. DHEW Publication No. (ADM) 78-661. Washington, D.C.: Superintendent of Documents, U.S. Government Printing Office; 1979.
109. Neitzert CS, Davis C, Kennedy SH. Personality factors related to the prevalence of somatic symptoms and medical complaints in a healthy student population. *British Journal of Medical Psychology* 1997;70(Pt. 1):93–101.
110. Newham D, Edwards RH. Effort syndromes. *Physiotherapy* 1979;65(2):52–6.

111. Noyes R, Reich J, Clancy J, O'Gorman TW. Reduction in hypochondriasis with treatment of panic disorder. *British Journal of Psychiatry* 1986;149:631-5.
112. Olfson M. Primary care patients who refuse specialized mental health services. *Archives of Internal Medicine* 1991;151(1):129-32.
113. Orleans CT, George LK, Houpt JL, Brodie HK. How primary care physicians treat psychiatric disorders: A national survey of family practitioners. *American Journal of Psychiatry* 1985;142(1):52-7.
114. Ormel J, Giel R. Medical effects of nonrecognition of affective disorders in primary care. Sartorius N, Goldberg D, de Girolamo G, Costa e Silva J-G, Lecrubier Y, Wittchen U., Editors. *Psychological Disorders in General Medical Settings*. Lewiston, N.Y.: Hogrefe and Huber; 1990:146-58.
115. Ormel J, Koeter MW, van den Brink W, van de Willige G. Recognition, management, and course of anxiety and depression in general practice. *Archives of General Psychiatry* 1991;48(8):700-6.
116. Ormel J, van den Brink W, Giel MWJ, van der Meer K, van de Willige G, Wilms FW. Recognition, management and outcome of psychological disorders in primary care: A naturalistic follow-up study. *Psychological Medicine* 1990;20:909-23.
117. Payne A, Blanchard EB. A controlled comparison of cognitive therapy and self-help support groups in the treatment of irritable bowel syndrome. *Journal of Consulting and Clinical Psychology* 1995;63(5):779-86.
118. Plesh O, Wolfe F, Lane N. The relationship between fibromyalgia and temporomandibular disorders: Prevalence and symptom severity. *Journal of Rheumatology* 1996;23(11):1948-52.
119. Potts SG, Bass CM. Psychological morbidity in patients with chest pain and normal or near-normal coronary arteries: A long-term follow-up study. *Psychological Medicine* 1995;25(2):339-47.
120. Quill TE. Somatization disorder. One of medicine's blind spots. *JAMA* 1985;254(21):3075-9.
121. Richard K. The occurrence of maladaptive health-related behaviors and teacher-related conduct problems in children of chronic low back pain patients. *Journal of Behavioral Medicine* 1988;11:107-116.
122. Robins LN. Psychiatric epidemiology. *Archives of General Psychiatry* 1978;35:697-702.
123. Rose G. *The Strategy of Preventive Medicine*. New York: Oxford University Press; 1992.
124. Rost K, Kashner TM, Smith RGJ. Effectiveness of psychiatric intervention with somatization disorder patients: Improved outcomes at reduced costs. *General Hospital Psychiatry* 1994;16(6):381-7.
125. Rothman KJ, Greenland S. Measures of disease frequency. Rothman KJ, Greenland S, editors. *Modern Epidemiology*. 2nd ed. Philadelphia: Lippincott-Raven Publishers; 1998.
126. Russo J, Katon W, Clark M, Kith P, Sintay M, Buchwald D. Longitudinal changes associated with improvement in chronic fatigue patients. *Journal of Psychosomatic Research* 1998;45(1 Spec. No.):67-76.
127. Schappert SM. National Ambulatory Medical Care Survey: 1989 Summary. *Vital Health Statistics* 1992;13(110):1-80.
128. Schrader H, Obelieniene D, Bovim G, et al. Natural evolution of late whiplash syndrome outside the medicolegal context. *Lancet* 1996;347(9010):1207-11.
129. Schweitzer R, Kelly B, Foran A, Terry D, Whiting J. Quality of life in chronic fatigue syndrome. *Social Science and Medicine* 1995;41(10):1367-72.

130. Sharpe M, Hawton K, Seagroatt V, Pasvol G. Follow up of patients presenting with fatigue to an infectious diseases clinic. *BMJ* 1992;305(6846):147–52.
131. Sharpe M, Hawton K, Simkin S, et al. Cognitive behaviour therapy for the chronic fatigue syndrome: A randomized controlled trial. *BMJ* 1996;312(7022):22–6.
132. Sharpe MC. Cognitive-behavioral therapy for patients with chronic fatigue syndrome: How? In: MA Demitrack, SE Abbey (Eds.). *Chronic Fatigue Syndrome: An Integrative Approach to Evaluation and Treatment*. New York: Guilford Press; 1996:240–262.
133. Shuchman M, Wilkes MS. Medical scientists and health news reporting: A case of miscommunication. *Annals of Internal Medicine* 1997;126(12):976–82.
134. Silver FW. Management of conversion disorder. *American Journal of Physical Medicine and Rehabilitation* 1996;75(2):134–40.
135. Simon GE, VonKorff M. Somatization and psychiatric disorder in the NIMH Epidemiologic Catchment Area study. *American Journal of Psychiatry* 1991;148(11):1494–1500.
136. Smith GR Jr. *Somatization Disorder in the Medical Setting*. Washington, D.C.: American Psychiatric Press; 1991.
137. Smith GR Jr., Monson RA, Ray DC. Psychiatric consultation in somatization disorder. A randomized controlled study. *New England Journal of Medicine* 1986;314(22):1407–13.
138. Speckens AE, van Hemert AM, Spinhoven P, Hawton KE, Bolk JH, Rooijmans HGG. Cognitive behavioural therapy for medically unexplained physical symptoms: A randomised controlled trial. *BMJ* 1995;311(7016):1328–32.
139. Struwing JP, Gray GC. An epidemic of respiratory complaints exacerbated by mass psychogenic illness in a military recruit population. *American Journal of Epidemiology* 1990;132(6):1120–9.
140. Sullivan MD, Katon W, Dobie R, Sakai C, Russo J, Harrop-Griffiths J. Disabling tinnitus. Association with affective disorder. *General Hospital Psychiatry* 1988;10(4):285–91.
141. Sullivan MD, Locser JD. The diagnosis of disability. Treating and rating disability in a pain clinic. *Archives of Internal Medicine* 1992;152(9):1829–35.
142. Swartz M, Landerman R, George LK, Blazer DG, Escobar J. Somatization disorder. Robins LN, Regier DA, Editors. *Psychiatric Disorders in America: The Epidemiologic Catchment Area Study*. New York: Free Press; 1991.
143. Symonds TL, Burton AK, Tillotson KM, Main CJ. Absence resulting from low back trouble can be reduced by psychosocial intervention at the work place. *Spine* 1995;20(24):2738–45.
144. Thompson WG. *Gut Reactions: Understanding the Symptoms of the Digestive Tract*. New York: Plenum; 1989.
145. Twemlow SW, Bradshaw SIJ, Coyne L, Lerma BH. Patterns of utilization of medical care and perceptions of the relationship between doctor and patient with chronic illness including chronic fatigue syndrome. *Psychological Reports* 1997;80(2):643–58.
146. van Dulmen AM, Fennis JF, Bleijenberg G. Cognitive-behavioral group therapy for irritable bowel syndrome: Effects and long-term follow-up. *Psychosomatic Medicine* 1996;58(5):508–14.
147. Vaughan KB, Lanzetta JT. The effect of modification of expressive displays on vicarious emotional arousal. *Journal of Experimental Social Psychology* 1981;17(1):16–30.

148. Vercoulen JH, Swanink CM, Fennis JF, Galama JM, van der Meer JW, Bleijenberg G. Prognosis in chronic fatigue syndrome: A prospective study on the natural course. *Journal of Neurology, Neurosurgery and Psychiatry* 1996;60(5):489-94.
149. Von Korff M, Katon W, Bush T, et al. Treatment costs, cost offset, and cost-effectiveness of collaborative management of depression. *Psychosomatic Medicine* 1998;60(2):143-9.
150. Von Korff M, Le Resche L, Dworkin SF. First onset of common pain symptoms: A prospective study of depression as a risk factor. *Pain* 1993;55(2):251-8.
151. Wagner EH, Austin BT, Von Korff M. Organizing care for patients with chronic illness. *Milbank Quarterly* 1996;74(4):511-44.
152. Walker E, Katon W, Harrop-Griffiths J, Holm L, Russo J, Hickok LR. Relationship of chronic pelvic pain to psychiatric diagnoses and childhood sexual abuse. *American Journal of Psychiatry* 1988;145(1):75-80.
153. Walker EA, Katon WJ, Hansom J, Harrop-Griffiths, Holm L, Jones ML, Hickok L, Jemelka RP. Medical and psychiatric symptoms in women with childhood sexual abuse. *Psychosomatic Medicine* 1992;54(6):658-64.
154. Walker EA, Katon WJ, Keegan D, Gardner G, Sullivan M. Predictors of physician frustration in the care of patients with rheumatological complaints [see comments]. *General Hospital Psychiatry* 1997;19(5):315-23.
155. Walker EA, Keegan D, Gardner G, Sullivan M, Bernstein D, Katon WJ. Psychosocial factors in fibromyalgia compared with rheumatoid arthritis: II. Sexual, physical, and emotional abuse and neglect. *Psychosomatic Medicine* 1997;59(6):572-7.
156. Walker EA, Roy-Byrne PP, Katon WJ, Li L, Amos D, Jiranek G. Psychiatric illness and irritable bowel syndrome: A comparison with inflammatory bowel disease. *American Journal of Psychiatry* 1990;147(12):1656-61.
157. Warwick HM, Clark DM, Cobb AM, Salkovskis PM. A controlled trial of cognitive-behavioural treatment of hypochondriasis. *British Journal of Psychiatry* 1996; 169(2):189-95.
158. Wessely S, Nimnuan C, Sharpe M. Functional somatic syndromes—one or many? *Lancet* In Press.
159. Wessely S, Rose S, Bisson J. Brief psychological interventions (“debriefing”) for treating immediate trauma-related symptoms and preventing post-traumatic stress disorder (Cochrane Review). In: *The Cochrane Library* 1999; Oxford: Update Software.
160. Weyerer S, Kupfer B. Physical exercise and psychological health. *Sports Medicine* 1994;17(2):108-16.
161. White KL, Williams F, Greenberg BG. The ecology of medical care. *New England Journal of Medicine* 1961;265(18):885-92.
162. Woodman CL, Breen K, Noyes RJ, et al. The relationship between irritable bowel syndrome and psychiatric illness. A family study. *Psychosomatics* 1998;39(1):45-54.